The Builder.

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The London Building Act.—III.

ONE new provision we omitted to mention in our last, in regard to furnaces and ovens—viz., that the floor *over* any room or enclosed space in which a furnace is fixed, and any floor within 18 in. of the crown of an oven, must be constructed of fire-resisting materials.

The provisions as to construction of stairs, passages, &c., in public buildings and in buildings more than 125,000 ft. in cubical extent, and used for separate families, are now combined in the same section (68),* with the verbal difference that the word "fire-resisting" is substituted for "fire-proof."

Section 69 makes a new provision to the effect that in every building constructed or adapted to be occupied in separate tenements by more than two families the staircase used in common shall be ventilated upon every story above the ground story by windows or skylights opening direct into the outer air, or "shall be otherwise adequately ventilated," and that the principal staircase of a dwelling-house not included under the above definition shall be ventilated by a window or skylight to the external air.

The minimum of height "for habitable rooms" is raised from the present very inadequate 7 ft. to 8 ft. 6in., except in the case of habitable rooms wholly or partly in the roof, which must be 8 ft. in height throughout not less than one-half their area.

Sub-clause *c* of the same section (70) applies to *all* habitable rooms the provision at present only specially applicable (by the Public Health Act, 1891) to underground rooms, that the window area clear of sash-frames and "free from any obstruction to the light" (the last words are new) must be equal to one-tenth the floor area of the room. One-half the window or one-twentieth of the floor area (as at present) must be made to open, and the opening must extend to at least 7 ft. above the floor level. The area of window space demanded will deprive some very aesthetic architects of the little windows in which they delight, but on the other hand the space for opening and the height to which the opening need extend are somewhat insufficient. In a sanitary sense it is certainly bad for a room to have any considerable part of its space above the possibility of an open window. The window, it should be added, may open either into a conservatory or into the open air. For a room having no external wall or constructed wholly or partially in the roof the area of window may be one-twelfth the floor area, one-twenty-fourth to open, the opening to extend to 5 ft. above the floor level; or it may be lighted by a lantern-light of which a portion equal to one-twentieth of the floor area can be opened. The whole area of the "lantern light," for some reason, is not specified.

In a building which is a dwelling-house* any basement with a wooden floor shall have (Section 70 *d*) a sufficient space under to admit of ventilation (this is provided by the Public Health Act as to "underground rooms") unless it is a floor "constructed of solid wood bedded on concrete."

A habitable room over a stable (Clause *e* of the same section) must be separated from the stable by a floor with a layer of concrete pugging of good quality, or of other solid construction 3 in. in thickness between the joists or girders, finished smooth on the upper surface and properly supported; the underside ceiled with lath and plaster. We doubt if this goes as far as is desirable. "A floor of brick or concrete or other solid material carried by iron girders" would have been better. A staircase or gallery by which any such room is approached must be separated from the stable, where adjoining it, by a brick wall not less than 9 in. thickness. Why necessarily a *brick* wall? Suppose it is a stable built of stone or concrete, must a brick wall be inserted in this particular case? The District Surveyor would probably say he had no power to allow anything else.

A special clause *(f)* provides that nothing in Section 70 affects or repeals any of the provisions of the Public Health Act, 1891, as to underground rooms, and a sub-section (2) provides that anyone who suffers a room to be inhabited which is not in conformity with the provisions of this section is liable to a penalty for every day the room remains so inhabited (amount of penalty not stated).

Section 71 repeats the existing law as to party arches or floors over public ways, &c., and Section 72 that as to arches under passages or public ways (24 and 25 of the 1855 Act), without alteration except as to a non-essential rearrangement of wording.

Section 73 brings us to the important subject of "projections." Sub-section 1 repeats in the main the provisions of the first sub-section of Section 26 of the 1855 Act, but with the following modifications: to the list of projections which are to be of fire-proof material are added "outside-landing outside-stairs and outside-steps"; to the phrase "eaves and cornices" is added "barge-boards"; in the sentence excepting the cornices, &c., of detached and semi-detached dwelling-houses the words "distant at least 15 ft. from any other building and from the ground of any adjoining owner" are struck out, and a sentence is added excepting also "dwelling-houses in which the party-walls are corbelled out so as to project 4 in. beyond such eaves, barge-boards, or cornices." It is added that "for the purpose of this subsection a pair of semi-detached houses shall be deemed to be one building." It does seem extraordinary that the framers of the Bill, having got thus far in considering a semi-detached house as one house, should nevertheless have stopped here, and refused to consider them as one building in regard to the projection of the party-wall above the roof.

Sub-section 2 provides that every balcony, cornice, or other projection must be tailed into the wall, and weighted or tied down to the satisfaction of the District Surveyor, and that no cornice shall exceed 2·6 projection over the public way. To this latter provision we have already referred. It may be a very wholesome rule for the narrow streets proposed by the Act, but as a restriction for a monumental building abutting upon a wide street it would be absurd. Sub-section 3 repeats the existing provision as to the extent of projection of shop-fronts and cornices beyond the external wall of the building, to be allowed in the two cases of streets or ways of less and of more than 30 ft. wide: but to it, after the present closing words "to any extent not exceeding 18 in. beyond the external wall of the building to

* We used the word "clause" in previous articles for the principal numbered divisions of the Act, but as the word "section" is used in all references in the Act it is better to adopt that. "Section" in this article therefore means the same as "clause" in the two preceding articles

* A dwelling-house is described among "Definitions" as "a building used or constructed or adapted to be used wholly or principally for human habitation."

which it belongs," are added the words "over the ground of the owner of the building provided that this provision shall not authorise in any such street the projection of any part of any such shop-front other than the cornice on or over the public way or any land to be given up to the public way." This clause was a somewhat confused one before, but it is now confusion worse confounded. We are told almost in the same breath that a shop cornice may project 18 in. "over the ground of the owner," and that this provision does not authorise the projection of any part of the shop-front other than the cornice over the public way." Then what is the meaning of "over the ground of the owner?" Is the cornice regarded as projecting over the owner's land or over public land? Or do the words, "over the ground of the owner," mean that the cornice is not to extend further than the width of the premises—not to mitre beyond them? If that is the meaning, could anything be worse expressed? And when we are told that nothing but the cornice shall project over the public way, then over *what* is the other projection of the shop-front, of 5 in. or 10 in. beyond the external wall? Is not that over the public way? or is the external wall supposed by a fiction to be set back 5 in. or 10 in. (as the case may be) to allow for these projections? Which is the real line of the public way, the "external wall" or the projections? The whole sentence is a complete muddle of contradictory expressions; we may presume that District Surveyors know what it means, but if they do it must be by some inner light, for the clause certainly does not explain itself. The worst of it is that all this rigmarole is only for the purpose of aiding and abetting the architecturally absurd notion, which belongs to a past age, that shops have some special need for the introduction of gimcrack pilasters and consoles flanking their windows. It would have been a wholesome aesthetic lesson to tradesmen if they had only been taught, by the abrogation of this clause, that they could do without such sham architectural scenery.

Sub-section 4, again, reaffirms the absurd clause to the effect that no shop-front shall be fixed nearer than four inches to the centre of the party-wall, where the adjoining premises are separated by a party-wall (this conditional sentence is new), "unless a pier or corbel of stone, brick, or other incombustible material four inches wide at the least be placed as high as such woodwork and projecting throughout an inch at least in front thereof between such woodwork and the centre of the party-wall." That is to say, the woodwork is not to approach nearer than four inches to a certain point, unless there is a projection of four inches between it and that point! How, then, can it approach any nearer? Really the opportunity might have been taken to get rid of such nonsense as this. A new provision in the same sub-section is that no part of the woodwork of a shop-front shall be fixed higher than twenty-five feet above the level of the pavement. That is a reasonable requirement; the whole of the rest of the paragraph is pure nonsense.

Sub-section 5 provides that:—

> "In a street of a width not less than forty feet or to a building the front wall of which is not at a less distance than forty feet from the opposite boundary of the street bay windows to dwelling-houses may be erected on land belonging to the owner of the building notwithstanding the provisions of this Act relating to buildings beyond the general line of buildings in streets provided that such bay windows—"

then follow the provisions. These are (*a*) that the window does not exceed three stories in height; (*b*) does not project more than three feet from the main wall of the building to which it is attached; (*c*) does not project within the prescribed distance of the centre of the roadway; (*d*) is not nearer to the nearest party-wall than the amount of its projection from its own building; (*e*) does not exceed in width three-fifths of the frontage of its own building; (*f*) is not constructed upon any part of the public way; (*g*) shall not be used for trade purposes. Here is some more blundering. The street must be at least 40 ft. wide; but according to Section 11 (*i*) it is obvious that the width of a street, if the houses have forecourts, is the width between the forecourt boundaries. In the case of the house whose front wall is not less than 40 ft. from the opposite boundary the bay is only to be built out *on the owner's own land*. But if the external wall of the house is 40 ft. from the external wall of the opposite boundary, and the owner has in front of him the required 3 ft. on which to project his bay-window, it is obvious that in that case the street is only 37 ft. wide, which is contrary to the Act, and contrary to the apparent intention of this section, and the bay window cannot be built at all. This is even emphasised by paragraph *c*, that the bay window is not to project within the "prescribed distance" from the centre of the road. The term "prescribed distance" has been defined as 20 ft. If the front wall of the house is only 40 ft. from the opposite boundary, the bay window *must* come within the "prescribed distance." The only way out of the dilemma is to suppose that these expressions are intended to refer to the case in which it is intended to ultimately set back the opposite boundary, and the centre of the road has been "defined" by the superintending architect on a line different from the actual centre. That explanation is possible, but we do not think that any one who reads the clause will easily be persuaded to think that such was its intended meaning. It appears to us that whoever drew up the clause had got befogged amid the technical phraseology of the Act, and forgot to apply the elementary rules of addition and subtraction. The next sub-section, in regard to oriel windows, provides, under the same general rule, that the window may project 3 ft., provided it only projects 1 ft. over the public way. That, in the case of the house "40 ft. from the opposite boundary," reduces the road to 38 ft. wide. If there is any explanation to be given of this curious clause other than we have been able to appreciate, we shall be glad to hear what it is, but we think a good many people besides ourselves will find the same difficulty in making consistency or common sense out of it.

The provision as to "the roof-flat or gutter of any building" (sub-section 7) runs as at present, and sub-section 8 repeats the corresponding clause [Section 26 (6)] of the 1855 Act, except that to the opening words, "except in so far as permitted by this section in the case of shop fronts," the words "and projecting windows" are added.

Section 74 deals with the separation of buildings. The present requirement that "every building shall be separated by external or party-walls from any adjoining building" is particularised further by the addition of the words (after "party-wall") "or other proper party-structure," which includes horizontal as well as vertical divisions between buildings. The words are also added at the end of the clause "and from each of the adjoining buildings if more than one." If we understand English the words "from any adjoining building" were quite sufficient without these additional words; or, at any rate, the addition "or buildings" would have entirely met the case. Sub-section 2 is a new provision to the effect that in every building exceeding ten squares (1,000 superficial feet) in area, used partly for trade or manufacture and partly as a dwelling-house, the trade and the dwelling-house portions must be separated by walls and floors of fire-resisting materials, and all the passages and staircases for access to the dwelling-house portion must be constructed of such materials, The part used for purposes of trade or manufacture (if extending to more than 250,000 cubic feet) will be subject to the provisions of the Act as to cubical extent of buildings of the warehouse class (Sections 75, 76). But openings between the trade and dwelling-house portion, as in any other of the walls, may be made as required, if fitted with fire-resisting doors.

By sub-section 3 the present provision that in a building of more than 3,000 square feet in area separate sets of chambers or rooms tenanted by different persons shall be deemed to be separate buildings, and be divided accordingly by party-walls or fire-proof floors, is modified as follows: the minimum of area is altered from "3,600 square feet" to "25 squares" (2,500 square feet); the chambers are *not* to be considered as separate buildings, but it is provided that the floors and staircases shall be of fire-resisting materials. This, though it seems at first sight less stringent than the present law, is really more so, as it demands fire-resisting staircases as well as floors. The probable object of the altered wording is indicated in the added proviso that "this provision shall not entitle the District Surveyor to charge for the inspection of each set of chambers as a separate building." The sentence is unnecessary legally, as the phrase that such chambers shall be "deemed to be separate buildings" is abolished from the body of the clause; but the framers of the Act, in some cases so vague in expression, seem to be seized at times with a morbid desire for excessive precision. The provision as to the Surveyor not having power to charge for each set of chambers separately was absolutely required in the old Act, but was not there; the altered wording of the clause renders it totally unnecessary, but it is now inserted; such are the eccentricities of drafting.

In Section 75, already referred to, the present provision that a warehouse or building used wholly for trade or manufacture must not have a greater content than 216,000 cubic feet, or must be divided by party-walls into sections of not more than that extent, is reaffirmed with another arrangement of wording, and with the important difference that the maximum cubical extent permitted is raised to 250,000 cubic feet. The qualifying words "except as in this section provided," are inserted in the clause. This section is extended, however, by two new paragraphs. The first of these provides that no addition shall be made to any building of the warehouse class or to any division thereof, so that the cubical extent of such building or division shall exceed 250,000 cubic feet. Another eccentricity of drafting, as the clause is quite unnecessary; it is covered by the first clause. The second new clause is the one indicated by the words "except as in this section provided," and is an important innovation. It excepts from the provisions of the section any building (not within two miles of St. Paul's Cathedral) which is used wholly for the manufacture of the machinery and boilers of steam-vessels, or for a retort-house, or the manufacture of gas or for generating electricity, provided that such building consists of one floor only and is constructed of brick, stone, iron, or other incombustible material throughout, and is not used for any other purpose than those above specified. Such a building shall be considered not only (apparently) as out of the jurisdiction of section 75, but as one "to which the general rules of this Act are inapplicable." That is rather an unnecessarily large concession, which may lead further than was quite intended, especially as there is not even the usual provision that it should be done "to the satisfaction of the District Surveyor."

Section 76 provides that, in the class of buildings dealt with in the preceding section (those warehouses which are restricted to 250,000 ft. cubical extent), the Council, if satisfied by the report of the Superintending Architect and the Chief Officer of the Fire Brigade that additional cubical extent is necessary for any particular trade, and that proper arrangements have been made for lessening, as far as practicable, the danger from fire, may consent to an additional cubical extent, but only under the following con-

ditions: (i) that the building shall not extend to more than 450,000 cubic feet or any less number allowed by the Council, without being divided by party-walls, so that each division does not exceed that cubical extent; (ii.) that the building is not more than 60ft. high; (iii) that it is not used for any trade involving the use of explosive or imflammable materials. The consent is only to continue in force as long as the building is actually used for the purposes for which the permission was granted. All this is a sensible and well-considered concession to some of the requirements of modern manufacture on a large scale.

Section 77, on "the uniting of buildings" re-enacts the provisions of Section 28 of the 1855 Act, with the following additions: To the sentence "wholly in one occupation" is added "or constructed or adapted to be so"; "250,000" cubic feet is of course substituted for "216,000"; to the clause limiting the height and width of openings in the party-wall is added the requirement that "such openings taken together shall not exceed half the length of the party-wall on each floor," a very necessary condition, as at present the wall might consist of a row of large doors and narrow piers and the law could not interfere, provided the area of the doors was not more than half the area of the whole wall of the story (Section 54, Subsection 2 *c*); wrought-iron sliding doors in grooved or rebated iron frames may be substituted for hinged doors; if the wall is at least 2 ft. thick and the doors at least 2 ft. apart they may be 9 ft. 6 in. high instead of 8 ft.; the brick or stone wall blocking up the openings when the buildings cease to be united need not be more than 13½ in. thick whatever the thickness of the wall (we cannot approve of this at all, it does not make what builders call nearly such a "good job" as building up the opening the full thickness of the walls). Lastly, when the buildings which have been united cease to be under one occupation, "the owner thereof" shall give notice of the fact to the District Surveyor, and shall forthwith proceed to block up the openings in the manner prescribed. "The owner thereof" is a phrase admitting of some ground for dispute. It means of course the person who owned the two buildings when united, but when they have ceased to be "in one occupation" there are two owners, and there would be some opening for one to try to throw the onus of the work on the other.

Section 78 is a repetition of Section 30 of the 1855 Act providing (in the same terms) that every public building, notwithstanding anything in this Act, shall be carried out to the satisfaction of the District Surveyor, or in the event of disagreement to that of the Tribunal of Appeal (instead of the "Metropolitan Board" as in the old Act). But two new clauses are added, to the effect that no public building shall be occupied as such till after the approval of the District Surveyor or of the Tribunal, and that after such approval no work likely to affect the building shall be done on it without the approval or certificate of the District Surveyor.

The rules for the conversion to a public building of a building erected for other than a public purpose are given (Section 79) to just the same effect and in nearly the same words as in the existing law, only substituting "the Tribunal of Appeal" for the words "the Council"; the reference to "the Metropolitan Building Act of 1855 and the Acts amending the same" is of course struck out.

Section 80 gives detailed and in most respects new directions as to staircases in churches and chapels, meeting-houses, public halls, lecture-rooms and exhibition-rooms, and places of assembly, the summary of which is as follows:—

(*a*) Stairs to be enclosed by brick walls at least 9 in. thick, and treads of uniform width (this latter rather vague expression probably means that there are to be no "winders," though the words will admit of another interpretation):

(*b*) No staircase to be less than 4 ft. 6 in. wide unless where the accommodation is for not less than 200 persons, when they may be 3 ft. 6 in. wide:

(*c*) Staircases, corridors, and passages to be increased by 6 in. in width for every 100 persons above the number of 400, up to a maximum width of 9 ft.; staircases more than 6 ft. wide to have a handrail in the middle; two staircases, corridors, or passages may be substituted for one provided they are each two-thirds of the width required for the one, except that they must in no case be less than 3 ft. 6 in. wide:

(*d*) Where the public are accommodated at different levels, a separate staircase or corridor must lead directly to the street from each level:

(*e*) All doors and barriers must open outwards, and no outside locks or bolts are to be affixed to them.

A building formed under or by the enclosure of a railway-arch, and adapted to be used for human habitation, must conform to all the regulations of the Act, in the same sense "as if the building were built in any other position."

In regard to temporary structures, the provision in Section 56 of the 1855 Act in regard to iron buildings is adopted (Section 82) in nearly the same words as at present, with the addition, after the word inapplicable, of the words "or in the opinion of the Council inappropriate having regard to the special purpose for which the building or structure was designed," which gives a further power of discrimination in regard to the application of the provisions of the Act. The remaining provisions in respect to this subject are the same as at present, though arranged and worded rather differently, but Section 83 introduces an important and most desirable new provision to the fact that where the Council think fit, in accordance with the preceding section, to approve of the erection of an iron structure, they may limit the time during which it shall be allowed to remain and make such conditions as to its removal as they may think fit, and if the structure is not removed at the specified time the Council may summon the owner or occupier, and the Court may authorise the Council to enter on the land, remove the structure, and sell the materials unless their expenses in removing them are repaid within fourteen days.

The law as to wooden temporary structures is modified in wording by the sentence "except hoardings enclosing vacant land and not exceeding in any part 12 ft. high." Hoardings to land which is not "vacant" are not dealt with in the Act.

Section 85 provides that this portion of the Act shall not apply in the case of a pile, stack, or store of timber not being a structure affixed or fastened to the ground.

Structures or erections on the premises of any railway company and used for the purpose of or in connexion with their traffic are exempt from the operation of this part of the Act.

This completes the legislation as to new structures.

NOTES.

THE Royal Commission appointed to consider the conditions under which the City and County of London can be amalgamated, have presented an interesting Report. It has, however, the fatal flaw of being based on the assumption that Parliament is in favour of the amalgamation of the City with the rest of London. As a matter of fact, Parliament has never yet declared for such amalgamation, and, therefore, any scheme for carrying it out is obviously premature. But as the Government of the day set the Commission this academic task to perform, it was bound to do its best, and the result is the Report in question. Briefly stated, the Report recommends that there should be one Municipality for London, which should absorb both the existing County Council and the Corporation of the City. But, in fact, this would be no more than the addition of eight members to represent the City to the present County Council. The Commissioners further recommend the creation of several minor Corporations to undertake the work of the present vestries and district boards, and of the Commissioners of Sewers in the City, such as highway, sanitary, and similar duties. The greater Corporation would exercise the present functions of the County Council and the Corporation of London combined, such as the administration of main sewers, main roads, fire brigade, and so forth. That the creation of a number of minor Municipalities in place of the existing local bodies would be extremely desirable cannot be doubted, and we see no reason why this should not be done. It does not in any way involve the amalgamation of the City Corporation and the County Council, which is a matter for much consideration. No doubt the creation of a single Municipality would introduce a greater uniformity of local government in the Metropolis. But whether there is sufficient reason for such a change is most doubtful. The City of London is a district of very special characteristics, the like of which in wealth and historical renown is not to be found in the world, and the Corporation performs its functions to the satisfaction of the citizens and of the country generally. What would be the practical advantage—as distinguished from a mere paper symmetry—of an amalgamation of the City with the County Council is not clear. The County Council has work enough and to spare; it can, by the efficient and dignified performance of its duties, obtain all the honour that it can wish for. London is large enough both for the Corporation of the City and for the County Council, and the former has a special place in the country to fill. At present we do not perceive sufficient grounds for what would be the practical abolition of the historic Corporation of the City of London, and this report, able and ingenious as it is, does not make the proposed amalgamation look more desirable.

THE loss of tradition concerning the making of beautiful things, and public indifference to the fact, seldom, we imagine, makes itself so evident as when the Church presides over an exhibition of "Ecclesiastical Art." The association between worship and beauty was once so close that one cannot but feel the pity of it when an opportunity is thrown away of showing that this association is not absolutely broken. And there could be no fitter time for such demonstration than the occasion of a Church Congress. For there is no doubt that the clergy are, as individuals, deeply interested in the matter of making their churches beautiful. They are, for the most part, liberal in their ideas and willing to be guided. Where competent advice is not followed, it is more often the fault of the churchwarden than of the parson. Yet we find at Exeter again, as we have found elsewhere, a so-called Exhibition of Ecclesiastical Art, opened in state by the Mayor, and under the immediate patronage of the Bishop, containing nothing more original than may be seen in most shop windows. By such an exhibition church ornament and furniture are being advanced in no way. It is merely leaving such things where they are found. Or worse even, for side by side with altar or lectern which may possess some claim to merit, you find a stall purveying diamond cement, the Chicago World's Fair challenge set of pen and pencil, or someone who will sell you non-intoxicating orange champagne at 6s. the dozen. In place of these latter at least we might look for something original in modern design; the publications of the Fitzroy Society, cartoons for windows by Kempe, or such finishings as have so added to the beauty of Holy Trinity, Sloane-street. As the exhibition is arranged with the spaces

leased out by a promoter at so much a yard, one could not have hoped for such assistance, but it might have been otherwise. To turn to the exhibits, there is the usual supply of brass eagles, distributed between such firms as Messrs. Willis & Jones, Benham & Froude, Hart & Son, or Whipple. Messrs. Willis & Jones have, in addition, a handsome wrought-iron lectern for St. Matthew's Church, Tulse Hill. Several stained-glass firms are represented, and as far as designs go, we prefer those by Messrs. Heaton, Butler, & Bayne, made, we fancy, by their clever draughtsman, Mr. Wilson. This artist gives height and a largeness of scale to his figures that always tell. Messrs. Savel & Co. have some neat examples of the use of lead tracery, throwing the lead into curves and sweeps in place of keeping it uniformly flat. The late John D. Sedding was one of the first to adopt this treatment, and it is very effective with white glass. Messrs. Burnet & Co. have some very cheap materials, plush and silk ground tapestries quite telling in themselves, and so getting rid of the necessity of some indifferent embroidery. The embroidery on view from several firms and sisterhoods is, generally speaking, not interesting. The festival grounds of heavy greens and reds overload the colour schemes, and the designs are stiff without being mediævally quaint. The freedom of some of the sixteenth and seventeenth century Italian work in foliated design might surely serve as an example, and there lies a fine chasuble of such a kind hard by. There is a small loan collection of old church plate, but it is in a case and not easy to examine. It contains a handsome chalice from the parish church near Truro, made (according to the date-letters given by Cripps) in the first quarter of the sixteenth century. If there is any difficulty about securing first-class modern work, why not confine such an exhibition to objects of like value? One welcomes the Arundel Society, with its familiar pre-Raphaelite saints and scenes; and equally welcome is a fine bookstall of the Oxford University Press, where Professor Skeats' last volume of Chaucer beckons you from the shelf. We are bound to say that the books come somewhat as an oasis in the desert. We remember once hearing Mr. Walter Besant complaining bitterly that the author did not rank as an artist. We failed to see at the time in what way the author was the sufferer. We are at any rate convinced of the superiority of his craft at an Ecclesiastical Art Exhibition.

THE proposal to reproduce a part of "Old Berlin" at the 1896 Industrial Exhibition at Berlin has been approved of by the Historical Society, and the quarter chosen will probably be that near the Muhlendamm, adjacent to the Spree. The first meeting of the various sectional committees for the Exhibition after the recess was held last week, and great progress in the organisation is reported from all sides. The number of applications for space assures the success of the undertaking. The last day for receiving these is fixed for November 15; the space allotted to the various buildings is nearly five times as extensive as was required at the last exhibition in 1879. The executive offices are at 160, Gartenstrasse, Berlin.

OUR neighbours on the other side of the Channel do not seem to be as fortunate in the matter of coal finding as the promoters of the Channel Tunnel scheme. Flushed by the success of the engineer of that undertaking in discovering coal at Dover, and buoyed up by the knowledge that coal exists and is worked in the Boulonnais, a few French capitalists some months ago put down a trial boring near Calais. M. Gustave Dollfus, an eminent French geologist, plainly told the executants of the new *forage* that they were running great risks in venturing their money, but that there was just a possibility of success. The nearness of the selected spot to Dover, and the fact that, under normal conditions, the coal was bound to strike across the Channel, were factors in the problem that could not be resisted. So the boring was prosecuted with considerable vigour. We now learn that at a depth of 325 mètres the tools have alighted upon rocks of Devonian age. In other words, they have found the formation that under ordinary circumstances occurs *beneath* the Coal Measures. Nevertheless, the bold *entrepreneurs*, though it is only a few days since the mortifying discovery was made, have decided to go on with the work. Judging from the known disposition of the rocks along the line of strike, it is just possible that these Devonian beds are inverted, or thrust-faulted, and that the Coal Measures may be found under them after all. The problem now presented is very similar to that obtaining in the London area. Here also we have found Devonian rocks, but no one has had the courage to test their thickness. If the French really do find the Coal Measures at Calais, after what has happened, it will render the occurrence of coal under London almost a certainty.

IN the sale of some properties, mostly grazing-farms and building-land, in the Blackmore Vale district, otherwise known as White Hart Forest, is included the "Old House" at Blandford. The house escaped from the fire which, in 1731, consumed nearly all the town. It was built, somewhat after his native style, by Joachim Sagittary, *obiit* 1696, locally called the "High German Doctor." Having a high-pitched roof with attics, it is of red brick, the walls being distinguished by a liberal amount of string-courses, mouldings, and projecting blockings made, for the most part, by cutting and rubbing *in situ*. Two chimney-stacks collect the flues; each has a bold cornice, above which the stack is splayed into an octagon with a detached column before each face, and a dado and entablature breaking round the whole. A view, with details, will be found in Hutchins's "Dorset," third edition, 1868. After the fire the Town Hall was rebuilt after the designs of John Bastard, of Blandford, who also, with William Bastard, built the church, in the Classic style, 1738-9. The district in which the properties are situated was familiar to Fielding, who passed much of his boyhood at East Stower, in a stone-built farmhouse that was demolished sixty years ago.

THE annual report of Mr. Norrington, the Surveyor to the Vestry of Fulham, contains among other matters of interest some information as to recent experience with wood paving, in the form of schedules. The Surveyor is very anxious to encourage the use of the hard Australian woods for this class of paving, and points to an example of the unsuitability of deal in the case of some paving in the North End-road, Fulham, which was laid down in January, 1889, and is now unfit to remain through the coming summer. Taking the largest area of wood paving proposed to be laid down, 13,100 square yards, we find the results as follows:—

	Creosoted deal.	Karri-wood.	Jarrah-wood.
Cost per yard, including allowance for repairs	12*s.*	15*s.*	15*s.*
Total cost	£7,860	£9,825	£9,825
Annual cost spread over duration of wood	£1,137	£796	£845
Probable duration	8 years	16 years	15 years

The figures are conclusive in favour of the Australian woods in a financial sense, while in every other respect a close and compact wood must be better than a soft one. In regard to pavements generally, the Surveyor (who has no scruple about lecturing his Vestry roundly) objects strongly to the multifarious pavements used in the district, especially as the gas, water, and other companies are constantly disturbing them, and the difficulties of proper repair are much increased by the variety of materials used. "The Vestry should decide on using one material for main thoroughfares and one for side roads." It is noted in connexion with this subject that the price of the best artificial stone is nearly the same as York, but that "whenever the pavements are disturbed a far greater number of artificial stones are broken than in the case of York." A large amount of work is to be done in the way of new ventilating to the sewers. The following passage as to the inspection of sanitary fittings of houses suggests matter for reflection:—

"By the resolution passed on December 22, the Drainage Inspector's duties were increased by an order to inspect '*All the sanitary appliances of new houses*,' in addition to his previous duties of testing and inspection of the drains, soil-pipes, and water-closets, and this term would include water cisterns and dust-bins. The Drainage Inspector is further required to check the erection of the forecourt walls, to see that the roads are the required widths.

Has the Vestry any knowledge of the value of the work this represents? Taking the value of the work to each house to average 30*l.* (a low figure when it is remembered that the large blocks of flats now being erected cost for drainage and sanitary fittings many hundreds of pounds each) it gives the enormous amount of 24,000*l.* as the money expended on this class of work in Fulham in one year. A surveyor in private practice would receive 5 per cent. remuneration, equal to 1,200*l.*, *and expenses*. The Vestry does not spend 250*l.*

It is quite impossible for only one Drainage Inspector to supervise all this work, and I may say that practically only the soil-pipes and drains are tested and inspected, and that '*all the sanitary appliances of new houses*' are left, to a great extent, to the discretion of the builder, although they closely touch the future health of Fulham."

Mr. Norrington's experience entirely confirms the opinion we expressed from the first that it was a mistake for the Vestries to make themselves responsible for the cleaning of the footwalks in front of houses, especially in regard to snow, "if only on account of the time which must necessarily elapse between the commencement of a fall of snow and the setting on a sufficient number of men to cope with it. Parliament ought rather to have enabled the Vestry to take proceedings against householders and owners of property who did not clear the footpath in front of their premises."

WE have also the annual report of Mr Weaver, Surveyor to the Kensington Vestry. Part of the report is occupied with a consideration of the London County Council's By-laws as to house drainage, some portion of which, being framed in reference to the Public Health Act, will, it is pointed out, lead to a conflict of jurisdiction between the District Surveyors and the parish officials, the former having nothing to do with the Public Health Act, and being bound to pass plans when submitted to him so long as they are in accordance with the Building Act. The whole analysis of these by-laws is a very useful one. We learn from the Report that increased attention has been given to the cleansing of the highways, especially during the summer, when cholera was threatening; every wood-paved road was washed and swept daily, and the roads wherein markets were formed on Saturdays were washed and swept every Sunday morning. In washing creosol was mixed with the water, so as to disinfect the road surface. Gullies were also liberally flushed, about 50,000 gallons of creosol and water being poured down them daily. In regard to this question of keeping streets in a sanitary state, we cannot but regret to see in the Report such a large list of wood-paved streets. Even constant washing cannot avail to keep wood-paving in as sanitary a state as asphalt or granite.

FROM our report of the proceedings of the London County Council it will be seen that the associated London water companies have unanimously refused to pay any attention to the request of the Council, backed by the opinion of some of the first sanitary experts of the day, that they would alter their limit for water-closet service cisterns

from 2 gals. to 3 gals. With admirable assurance, the water companies deign to add that they would be glad to concur in any arrangements "reasonably required for sanitary purposes without involving consumption of water for useless objects." So that the companies who deal in the water, who are not sanitary authorities, and whose interest it is to curtail the supply of water for the benefit of their shareholders, are to be the judges of what is useful or useless in the consumption of water! The Local Government Board has now been appealed to, and it is to be hoped they will take immediate and decisive action.

MAGAZINES AND REVIEWS.*

THE *Art Journal* contains an article "On the Banks of the Rhine," with reproductions from some very good brush sketches by Mr. F. Williamson. An article on "Birmingham Brass Work," by Mr. O'Fallon, contains examples which look pretty well in illustration, but which, we fear, owe some of their good effect to being not too precisely shown in detail in the mode of illustration adopted. We observe that all the designs are given as by "Messrs. —— & Co.," not with the name of the person who actually designed and executed them.

The *Magazine of Art* includes an article on the "Town and Cloth Halls of Flanders," by Mr. Alexander Ansted, with very free and effective sketches, in which however the architectural forms and details are hardly indicated at all. This method of sketching buildings produces picturesque illustrations, but must not be expected to satisfy those who are seriously interested in architecture.

The *Architectural Review* (Vol. III., No. 3) gives some account of the life and career of Charles Bulfinch, an early Boston architect, born in 1763, with illustrations of some of his works, including University Hall, Harvard College, and the Massachusetts General Hospital at Boston, a long prim front with the orthodox portico in the centre, now pleasantly grown over with ivy. The same number contains an illustrated account of the Academy at Athens, a building "constructed of marble from the same quarries as the Parthenon," from the designs of Hansen, of which we illustrated the exterior elevation in January, 1884; the *Review* gives a good many others, including a large view, from a photograph, of the interior of the Main Hall, in which the questionable expedient of a hypæthral opening in a sloping roof, which some critics want to attribute to the Parthenon, is practically illustrated.

In the *Nineteenth Century* Sir C. Robinson, under the title "English Art Connoisseurship and Collecting," gives an interesting historical sketch of the changes in taste and in the market value of different classes of works of art, since the period when the taste for collecting works of art was developed in this country.

The *Fortnightly Review* contains an article by Mr. Frederic Harrison with a very fascinating title, "An Antiquarian Ramble in Paris," but very disappointing and superficial. It is in fact merely a set of reflections, based on some popular and superficial guide-books, in regard to the great antiquarian interest of Paris; an interest which no one who knows anything of the history of Paris can ever have questioned. Mr. Harrison seems rather under the impression that this is a new light to every one else because it is so to himself, and he seems to have been content with purely "popular" sources for his information.

In *Harper* "Lahore and the Punjaub," by E. Lord Weeks, is a general article, but contains some illustrations of architecture and some notes on the buildings of Lahore. "The banks, public buildings, and Government offices are massive rectangular arcaded structures of pale yellow stone, each standing alone in a waste of gravel;" this is in the European quarter. The new "Scinde Club" is mentioned as a typical example of the Indian club-house generally. The illustrations are all of the ancient architecture and the people. "Golf in the Old Country," by Mr. Whitney, will interest many readers of all professions, and is illustrated by views of different golfing-links and club-houses.

In the *Century* the most important article of artistic interest is by Mr. Brander Matthews; it is called "Commercial Bookbinding," but it is intended to show how artistically good are some of the bindings now produced for ordinary issues of books, and some of the illustrations given fully bear out the remark. They are, however, we think rather exceptional. The "Old Dutch Masters" article for this month, by Mr. Timothy Cole, treats of Paul Potter, with an engraving of one of his well-known and (in its way) splendid work "The Young Bull."

In *Scribner* Mr. H. G. Prout writes an interesting article on "Railroad Travel in England and America," the illustrations of which are almost all of English stations and railroad carriages, in which American readers may be supposed to feel more interest than in those of their own country. The writer does full justice to the many good points in English railway travelling, and is, on the whole, quite impartial in his treatment of the subject. He even suggests that our system of looking after our own luggage has its advantages, and we gather incidentally that under the American "check" system of delivery, a traveller may have to wait some hours at a house or hotel before his luggage is delivered; a serious inconvenience which the English traveller is saved from by our system (or no system), however troublesome it may seem sometimes at the moment of coming to the end of a journey with a quantity of luggage. Mr. Prout expresses great admiration for the large English terminal stations both in their general appearance and in the comforts annexed to them—waiting-rooms, large booking-offices, dining-rooms, lavatories, &c. In these things we are declared to be an example to the whole world, American stations being "barbaric" in comparison.

IN the *English Illustrated* "Troy Town Revisited," by the author of "The Delectable Duchy," is a quaint description of manners and life in a small Cornish port, illustrated by some pretty sketches of old bits of buildings, quays, &c., by Mr. J. E. Rogers. Another topographical article is that by Mr. F. Dollman, of Cardiff, under the title "The Man and the Town," the "man" being the Marquis of Bute, whose portrait forms a frontispiece to the article, which is illustrated by reproductions from various photographs of the castle and the town.

In the *Pall Mall Magazine* the article most interesting to artists is that by Mrs. Pennell, entitled "Out of Our Window," a window looking on the Thames, illustrated with a number of charming sketches by Mr. Pennell. "Westminster" is the second of a series of articles by Mr. Walter Besant, illustrated by Mr. W. Patten; some of the illustrations being copies of old engravings or drawings of different portions of old Westminster Palace after the fire. "Vanished Rome" is an article by no less an authority than Signor Lanciani, but the illustrations, very good as they are, have mostly little or nothing to do with Rome, including as they do the Cathedrals of Pisa, Orvieto, and Salerno. The illustrations of the number almost throughout are excellent, which unfortunately cannot be said of all the writing.*

The *Cornhill* includes a pleasantly-written and picturesque article on "Abu-simbel" and Rameses II., and a short chat about "The Humours of Heraldry."

In *Blackwood* "The Streets of Paris Forty Years Ago" does not refer so much to streets in the architectural sense as to the people who frequented them, but it is an interesting reminiscence in every way, and the placard of the man who took portraits in the streets is worth quoting:—

"Portraits!

Ressemblance frappante ...	2 francs.
Ressemblance ordinaire.....	1 franc.
Air de famille	50 centimes."

There is a hint for portrait-painters anxious for business.

The *Antiquary* includes among its special articles "Notes on the Folk-lore of Bells," by Mabel Peacock, and an article on Denton Hall, one of the few remaining Jacobean houses in Northumberland, with some illustrations. We regret to hear that Dr. Cox, who has long edited the *Antiquary*, is retiring from it, and the November number will be the last under his editing.

The *Illustrated Archæologist* (quarterly) contains a well-illustrated article by Mr. Leonard W. King on "Ashurbanipal: His Books and Buildings," and an interesting article by Mr. W. Christian Symonds on "Sussex Iron," illustrated by many sketches of old ironwork.

In the *Essex Review* (quarterly) the old churches of St. Mary, Salcot Wigborough, and St. Mary the Virgin, Salcot Virley, are described and illustrated by Mr. F. Chancellor.

The *Reliquary* (quarterly) includes "Notes on the Cathedral Churches of Sweden" by Mr. T. M. Fallow, with some small illustrations; "The Pre-Conquest Churches of Northumbria" by Mr. Clement Hodges, and the "Heraldic System of Signs and Sign-boards" by Florence Peacock.

SANITARY CONGRESS AT LIVERPOOL.

ON the closing day of the Congress Dr. Thomas Stevenson, President of the Chemistry, Meteorology, and Geology Section, read his address, which dealt with the subject of the filtration of water. He alluded to the fact that bacteria were now recognised as the main agents in the purification of water, and that the micro-organisms in water were of two kinds: (*a*) pathogenic, or disease-producing, and (*b*) beneficent, or purifying organisms, to which should perhaps be added a third kind—inert organisms—acting possibly as purifying agents. But we remained still almost entirely in the dark as to how far pathogenic bacteria are destroyed by the non-pathogenic. The most interesting subject for investigation for sanitarians and the public was, what were the results brought about by sedimentation, solution, oxygenation, dilution, and light, and by the living processes of vegetable and animal organisms contained in water. The experiments of Franklin and Ray Lankester showed that by sedimentation all bacteria might be removed from water, but it could only be done under favourable circumstances, and when supplemented by other means of purification. Professor Percy Frankland had pointed out seventeen years ago the bactericidal effects of sunlight, but further experimental observation required to be made as to the effects of dim light upon the bacteria contained in water.

The notion that organic matter *per se* should be regarded as injurious to health must be laid aside, but there was danger in trusting too much to the purifying effects of light, air precipitation, and even filtration, and in neglecting the urgent necessity everywhere existing to protect our water supplies from pollution.

Papers followed on the "Health of Workmen in Chemical Factories," "Humidity in Cotton Mills," "Smoke Prevention," and the "Atmosphere of Liverpool," of which the first read by Mr. A. E. Fletcher, Her Majesty's Chief Inspector under the Alkali, &c., Works Act, was the most important.

In the Engineering Section several papers dealing with the management of sewage farms, the filtration and purification of sewage water, and the utilisation of sewage effluent for willow farming, were read, but the paper of greatest interest to our readers was one which properly belonged to Thurday's programme;—that on "The Purification of Exit-air from Hospitals for Infectious Diseases," by Mr. W. Henman, architect of the new Birmingham General Hospital. The system of screening the outgoing air, adopted at that hospital by Mr. Henman, has already been fully described in our columns. Mr. Henman observed that it was essential to the success of any method of artificial ventilation that its action should be uniform at all times, by night as well as by day, and when, as in all cases where purification depended on heating apparatus, uniformity was dependent upon the efficiency of the stoker, uniformity in this sense could not be regarded as secure. In a method of heating and ventilation devised by Mr. William Key, C.E., and carried out by him at the Victoria Infirmary, Glasgow, as well as in several other large buildings, propulsion instead of suction was employed, and this, after the inspection of all the systems in use in England, was the only one that had given, in his opinion, satisfactory results. The committee of the new General Hospital at Birmingham, on which 200,000*l.* are to be spent, had therefore resolved to adopt this method in providing their hospital with the means of cleansing, warming, and humidifying no less than 20 millions of cubic feet of air per hour, and for propelling it into the building, thus doing away with the necessity of open fires or steam or hot-water pipes, and requiring no opening of windows. The important feature of the Key system was an air-washing screen which cleansed the incoming air of all dirt and fog, destroyed flies and insects and entrapped a very large proportion of disease germs present in the atmosphere. The experiments proved that by keeping the screen moistened with

* The object of these notes is to point out anything in the contents of the current magazines which is of special interest to our readers, with occasional brief criticisms on the views expressed in such articles. When a magazine which has been sent to us is not noticed, it is because that number contains nothing that it is within our province to comment upon.

* We received the October number before the middle of September. If things go on at this rate we suppose presently magazines will all be issued a month before that of which they bear the date.

water the air was maintained in a proper state of humidity, and the remarkable phenomenon was observed of the air being moistened when too dry and being dried when over moist. To the design of Mr. Key the author added screens (somewhat similar to those employed by Mr. Key at the air intake), one at the head of every bed, a means being also provided of keeping the screens charged with a disinfecting fluid. In the new buildings an outlet flue would be provided at the back of each screen, so that as fresh air was constantly being propelled into the ward an equal quantity would be forced through the screens, all other outlets being stopped; consequently, almost immediately the air became contaminated, it would be again purified, even before it actually left the apartment, and thus purified air would pass up the flues and into the open.

The screens when independently tested by Dr. Sims and Dr. Cartwright Wood were found to permit the passage of only from one-third to one-fourth of germs of all kinds, and in their report these experts pointed out that still better results might be obtained by the use of finer screens. Among the economical results claimed for the system, besides much smaller initial cost than with heat purification, and the total elimination of the cost of maintenance, in fuel, cleaning, &c., was a reduction in the necessary cubic air space per bed. The author contended that with suitable appliances, by which the air could be constantly and quickly changed, buildings might be less in cubical capacity by at least one-third. Not only would this reduction in size more than compensate for the cost of the apparatus and its working, but the daily labour and charges for heating, lighting, cleaning, administration, and maintenance would be proportionately less. There was no doubt now about the effective elimination of germs by the screens; the only question left was as to the best form of screen. He proposed to use a finer Manilla fibre for his screens.

A discussion followed in which Dr. Vacher, Sir T. Crawford, Surgeon-Major Black, and several other experts took part.

Dr. Francis Vacher (Birkenhead) thought there would be a difficulty in effectively ventilating hospitals by propulsion, or, if it were done, that the results might easily be mischievous rather than beneficial. He had recommended moistened screens in a report he had drawn up many years ago upon the effects of noxious fumes in the vicinity of chemical works.

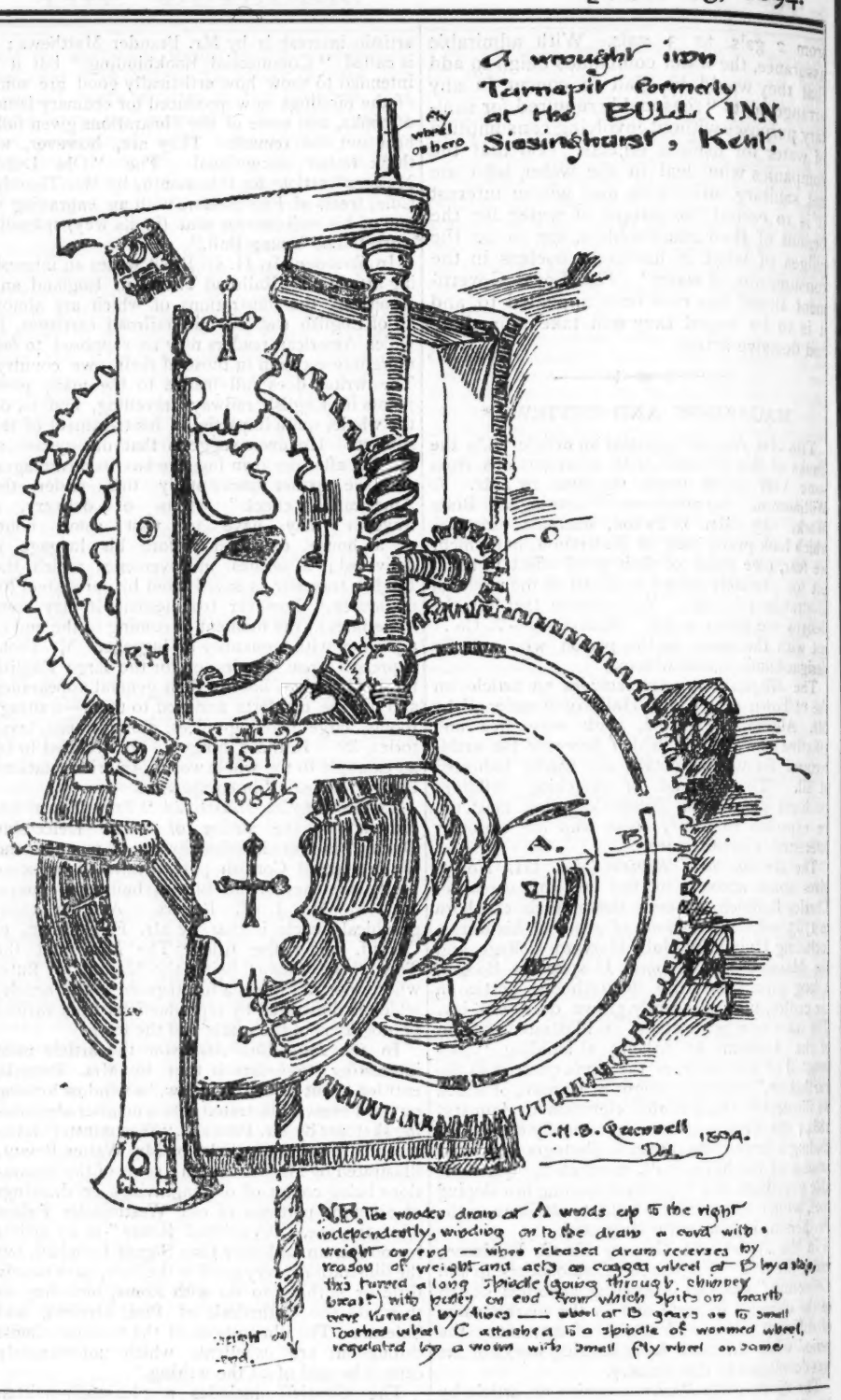
Surgeon-General Sir Thomas Crawford said the novel scheme proposed was one that required very careful consideration. He had had a very large experience of hospitals, and of screens for purifying the air of buildings. In hot climates our army was served out with apparatus for the circulation of air, and with screens very much like those here proposed. His experience of the process of forcing air into buildings was not in its favour. The difficulty was to regulate the amount of moisture, and he was not sure that they did not add more deleterious matter. The proposal to purify the air of hospitals was a retrograde one. The only safe and sound means for the supply of air was the natural one of obtaining it from a pure source in a free and natural flow.

In the course of the discussion the beneficial results obtained by sterilising the air of hospitals by means of the antiseptic process of Lister were pointed out, the correctness of the principle of admitting air at the top was questioned, and it was pointed out that any proposal to reduce cubical capacity, from motives of economy, was a retrograde step which the Sanitary Institute ought not to endorse; that all mechanical arrangements of the kind were apt to get neglected and fall into disuse, and that no figures had been given to show the actual economy of the scheme proposed.

Mr. Henman, in reply, said that all that Sir T. Crawford had advanced, he had heard hundreds of times. It was not likely that the authorities of Birmingham would sanction an expenditure of 200,000*l.* without having made ample enquiry on all points. He had been all over the country, and found everywhere that the cry was for ventilation, and the conviction was that it must be obtained by mechanical means. Where these had failed, it was because they had not been well managed. They could not always select a site in the midst of pure country air; they must often have their hospital in the centre of the town. Whether they had or had not hit upon the proper system, that system must be found. The thing must be done. In three or four years' time if they went to see the General Hospital at Birmingham, he believed they would admit that it had been done.

A paper by Mr. Robert Williams was then read, on the "Nation's Wealth," which was mainly on what may be called the political economy of sanitation, and was of a somewhat exaggerated and pessimistic character. Mr. James Walker (Liverpool) read a paper on "Domestic Boiler Explosions, their Cause and Cure," in which the action of one of the exhibits at the Health Exhibition held in connexion with the Congress was explained by the inventor. Boiler and cylinder explosions were ascribed to the formation of steam under pressure in a way that choked the safety-valves or other steam vents, and the means adopted for avoiding the formation of steam in such cylinders was described. There were no safety-valves or mechanical working parts in this arrangement, the water supplied, though very hot, being always a little below boiling-point. Hence no danger could ensue when the outlet might have been frozen up. A separation was made between the cylinder containing steam and water from the boiler and the cylinder supplying hot water for domestic use, the water in which was heated by conduction only, and was never liable to come into contact with red-hot or over-heated surfaces. This arrangement allowed of the lower cylinder, which was the only one containing the steam circulating from the boiler, to be freely ventilated, so that steam, if produced, could never be a source of danger. The water in the upper cylinder, which alone circulated in the house-pipes, being heated only by conduction, was not able to generate steam, and therefore could cause neither explosion nor collapse. The domestic boiler was supplied through an automatic syphon feed, which, it is claimed, prevents water entering the boiler when empty.

Papers were also read on two other exhibits by Mr. Wm. Darley, on the "Purification of Sewage and Foul Waters by the Magnetite Filter," and the "Filtration of Sewage by the Lowcock System," read by its inventor, Mr. S. R. Lowcock. "The Tub and Pail System" was the title of a paper read by Mr. G. J. C. Broom, C.E. (Borough Engineer of St. Helen's), which stated that there were twenty-four towns in England in which the "Tub and Pail" system was still largely in use. Fifteen of these towns, mostly in Lancashire, with a population of 2,599,633, had 232,334 pails, 136,444 water-closets, and 92,239 privies. The system was exclusively adopted in Rochdale in 1869, where great difficulties with contractors were previously encountered in the removal of excreta from the 4,000 middens then existing in the town. The middens and old privies now numbered only 138 for nearly double the population (72,325 persons), and the water-closets only numbered 650, while of pail-closets there were 18,147. The author condemned the system from many points of view, as well as on account of its heavy cost. In St. Helen's almost alone had any exact record of the cost of collection of the pails been kept. With a collection once a week, the average cost per pail per week had been found to be 2·368 pence, but a perfect pail system would require daily removal at six times the cost—a cost absolutely prohibitive. With all its disadvantages, the author regards the pail system as


A wrought iron Turnspit formerly at the BULL INN Sissinghurst, Kent.
fly wheel on here
RH
1ST
1684
A.
B.
C.
C.H.B. Quennell Del. 1894.
N.B. The wooden drum at A winds up to the right independently, winding on to the drum a cord with a weight on end — when released drum reverses by reason of weight and acts on cogged wheel at B by a pin, this turned a long spindle (going through chimney breast) with pulley on end from which spits on hearth were turned by lines — wheel at B gears on to small toothed wheel C attached to a spindle of worm wheel, regulated by a worm with small fly wheel on same
weight on end.

an immense improvement on the old midden system, and in the great towns of Lancashire and Yorkshire great reductions in the death-rate have followed upon its introduction.

In the course of the afternoon's discussion the absolute necessity of measures for the protection of rivers from pollution was strongly insisted on, one speaker pointing to the non-tidal section of the Manchester Ship Canal as an awful example of "a sink of iniquity."

At the close of the sitting a hearty vote of thanks was accorded, on the motion of Sir F. S. Powell, to the readers of papers and to the Council of University College for the use of the noble engineering theatre in which the meetings had been held.

At the general meeting of the Congress, which was held subsequently in the main theatre, the same and several other votes of thanks were accorded, the President of the Congress (Sir F. S. Powell), the Earl of Haddington, the Lord Mayor of Liverpool, Sir C. Cameron (ex-President), Sir T. Crawford, Major Lamorock Flower, Professor Hele-Shaw, Mr. Rogers Field, C.E., Mr. H. H. Collins, Mr. Symons (Registrar, Sanitary Institute), Mr. H. P. Boulnois, C.E., and Dr. Sykes, taking part in the proceedings. The declaration of the President that the Congress just concluding had been, perhaps, the most successful and interesting that had ever assembled since the Institute was founded, and that its debates would lead to important future results, was generally accepted and cordially approved.

The Sanitary Exhibition held in connexion with the Congress was more extensive than any of its predecessors. The most important exhibits were contained in the section "Hygiene of Building Construction," which included heating and ventilating apparatus, baths, sinks, closets, waste meters and preventers, tiles, sanitary pipes, filters, and sewage purification apparatus. Most of the following exhibits were rewarded either by awards of medals or certificates. Messrs. Doulton & Co., on a central stand near the entrance, showed specimens of glazed fire-places in "Old Gold" and other colours, with many objects in terra-cotta and glazed ware, baths, lavatories, sinks, and closets. The firm received a medal for their invention for making an effective soldered joint between metal soil-pipes and stoneware traps. Flanking the Doulton stand were two others nearly as extensive, that of the Albion Clay Co. (Woodville, Burton-on-Trent) and that of Messrs. Jos. Cliff & Sons (Wortley). Among the newest things shown by the Albion Clay Co. are the channel bends for manholes and inspection-chambers of Messrs. Jones & Sykes, the improvement in which consists in arching over the outlet end of the bend. A lip is formed in the upper wall of the channel bend to prevent sewage splashing, and there are other improvements in its form. An improved form of socket-pipe, called by the company the "Paragon," is shown on this stand, which has the sockets eccentric instead of being concentric, which, as stated, makes it impossible to lay them with a defective invert. To insure true alignment of the invert in laying, the workman must lay the pipes so that the word "Paragon" is always on the top. The sockets are flattened at the base to give them a firm bearing, and at the lower part are thickened and deeply grooved to hold the jointing material so that it cannot be forced out. At the stand of Messrs. Cliff & Sons many porcelain baths, lavatories, slop-sinks, &c., are shown, medals being awarded both for the "Imperial Porcelain Bath" and the "Cecil Porcelain Slop-Sink." On the two sides of the hall were shown Merrill's self-emptying lavatory, siphon cisterns, and syphonic discharge closet, shown by the Water Carriage Engineering Company, Sheffield; Dicksee's "Syphonic Closet" and Shanks's "Instanter," "Modern," and other lavatories in various forms, shown by Messrs. Shanks & Co., Glasgow, and the "Adamant Syphonic Latrine," "Twycliffe Closet Basin," and "Athena Lavatory Basin," shown by Mr. T. W. Twyford (Cliffe Vale, Hanley), all of which had merits that induced the judges to hold them over for further consideration before making the final awards, but certificates were given in the first list of awards to Mr. Twyford for the Athena Lavatory Basin, and another for the "Ideal Sink" and supports in enamelled fireclay; to Messrs. Shanks & Co. two certificates for lavatory basins, to Messrs. Doulton & Co. for their glazed fire-grates, and Messrs. Cliff & Sons for white and coloured glazed bricks and "Imperial" porcelain kitchen and scullery sinks. Other large exhibitors in these classes were Mr. George Jennings (Lambeth Palace-road), who was awarded a medal, and Messrs. J. Tylor & Sons (Newgate-street) who showed in addition Walker's patent sand washer for washing sand from filter-beds, a hospital bath on wheels, and other sanitary appliances for hospitals and public institutions.

Many were the forms of filter shown, and the apparatus for the purification and the treatment of sewage. Shone's Hydro-Pneumatic Ejector was exhibited by Messrs. Hughes & Lancaster, and models of sewage precipitation tank and filtering-beds, by Mr. Thos. Cosham (Newark). The sewage filtering and purification systems of the International Water and Sewage Purification Company (Victoria-street, London), by polarite, by the Magnetite Patent Filter Company (Liverpool), by means of magnetite, and by the Sewage and Effluent Water Filtration Company (Birmingham), by the Lowcock method, were amongst the most important of this class of exhibits. The two last-named systems were in daily operation at the exhibition, purifying sewage supplied daily from the Liverpool sewers. The Birmingham Company had a sectional model working in combination with a precipitation-tank on the Dortmund principle. After chemical treatment and precipitation in the Dortmund tank the effluent was passed through the filter, air being forced through at the same time by means of a Root's blower, driven by electricity. The inventor explained the *rationale* of the system before the Engineering Section of the Congress.

The magnetite system, which is the newer, was so far approved by the judges that they awarded to this filter a certificate in the first list of awards. It also had the advantage of being explained before the engineering section by a sanitary inspector, Mr. W. Darley, F.S.I., of Basford, Nottingham.

According to Mr. Darley, magnetite is more effective than other known substances in removing acetate of lead, sulphate of copper, or permanganate of copper from water which contains them in solution.

The Palatine Engineering Company (Liverpool) showed a hydrant, a fire-valve, and a tap, all inventions by Lord Kelvin (the tap being now well-known); Messrs. Deakin & Co. (Birmingham) a sewer-gas destructor, in which the ordinary street-lamp and its burner are said to do the triple work of extracting, lighting, and burning up the gases from the sewers beneath. The Drill Hall in which the exhibition was held was ventilated by electric fans shown by Messrs. J. H. Pickup & Co., of Bury, who received a medal, and the Blackman Ventilating Company, which also obtained a medal, exhibited exhaust-fans driven by electricity, by steam, and by water power.

THE SANITARY INSPECTORS' ASSOCIATION.

Under the auspices of this Association a course of lectures and demonstrations for sanitary officers was opened on Monday, at St. James's Hall, Piccadilly, Professor Vivian B. Lewes, F.C.S., F.I.C., delivering the first of a series of five lectures on "Combustion, and the Influence of its Products on Health."

Sir B. W. Richardson, M.D., LL.D., F.R.S., the President of the Association, occupied the chair, and briefly introduced the lecturer. In the course of his observations he expressed his willingness to assist in the provision of some award in connection with the examination which it was proposed should take place upon the lectures to be delivered.

The Lecturer remarked at the outset, that from the very earliest days combustion had been looked upon as one of the most important phenomena of nature. The old thinkers came to look upon it almost as a deity, and in very much that frame of mind combustion was approached until some two centuries ago. Then, as men's minds broadened many experiments were made to find out the true process of combustion, and what combustion really was. At the end of the seventeenth century a wonderful old philosopher, Becher, brought forward a theory which took a great hold of the minds of thinkers of the day, and a few years after his death, Stahl, physician to the King of Prussia, studied the question and propounded one of the first chemical theories we ever had. Looking at all the processes of combustion, and taking them in the aggregate, he came to the conclusion that every combustible subject really consisted of two parts, one which escaped while the burning was going on and gave the phenomena of burning, and one which remained behind and was really the product of combustion. This was called the phlogistic theory, and although it was afterwards shown to be absolutely wrong, it did more perhaps to bring about a true understanding and working of science than any theory that was ever put forward, simply because it was the starting point of order in scientific work. Towards the end of last century — some eighty years after Stahl first brought forward this idea — there came one of those marvellous waves of scientific thought over the whole of Europe which was experienced every few centuries, and left an indelible mark on the history of the countries. Lavoisier, a French philosopher with a marvellous power of collecting facts and producing theories from those facts, was able, with the assistance of men like Priestly and Cavendish, in England, a young doctor named Black in Scotland, and an apothecary named Scheele in Sweden, to tabulate not only the true theory of combustion, but also to give us other theories which put science on the true lines which it had followed ever since. With the aid of some interesting chemical experiments, Professor Lewes explained several of the discoveries made by Lavoisier. Black, he said, had dealt in a paper with the importance of studying not only what might be termed qualitative actions, but also quantitative results, and Lavoisier, seeing the importance of quantitative changes, was led to question the correctness of Stahl's theory, and at once propounded the idea that combustion must be not a giving off of the mysterious substance "phlogiston," but a taking into partnership of something else, during the process of combustion. As he went on with his labours Lavoisier found that the atmosphere was not an element, but really consisted of more than one gas, and his estimate that the atmosphere consisted in volume of one part of oxygen to four parts of nitrogen had proved to be practically correct. Afterwards oxygen came to be looked upon by Lavoisier not only as a vital principle, but also as the great supporter of combustion. The lecturer stated that if Lavoisier had gone further he would have been more astonished at the results he would have obtained, because he would have found that substances which were not looked upon generally as combustibles would burn with the greatest readiness by the aid of oxygen. He proceeded to give several examples of the great and marvellous power of this gas in urging on combustion, and he said these experiments showed that during all processes of combustion they had a substance, a combustible which, having an affinity for the oxygen which was present in the air, combined with that oxygen, and in its combination developed a heat which we knew as the heat of combustion. In putting forward that theory, Lavoisier put forward the true theory of combustion which had come down to us, and only required a slight amount of modification, and that was that the terms "combustible" and "supporter of combustion" were absolutely and purely relative, for a substance which under one condition was combustible, might under another condition become a supporter of combustion. To illustrate this the professor caused a quantity of coal-gas to burn in the pure air, and some pure air to burn in a quantity of coal-gas. In further remarks he explained how in the atmosphere the otherwise too active properties of oxygen were kept in check by that gas being mingled with nitrogen.

Professor Lewes' second lecture will be delivered on October 22.

Building Operations in Glasgow. — An interesting statement was made by Sir James King with regard to the progress of building in Glasgow at a meeting of the Dean of Guild Court there last week. He remarked that it was eighteen years since he last passed in review the work of the Court. The *Scotsman* reports that the total value of the work passed in the years 1874-75 was 1,826,150*l.*, while in 1875-76 it rose to 2,125,249*l.* That was followed by a period of severe depression. The greatest increase since then had been during the last two years. In the year ending August 31, 1893, the total value of the work authorised by the Court was 1,330,680*l.*, while in the year ending August 31, 1894, it was 1,275,445*l.* During the past year the houses erected were:—One room, 470; two rooms, 1,519; three rooms, 874; four rooms, 369; five rooms, 89; six rooms and upwards, 145—total number of houses, 3,466. The number of shops erected was 123, and the total estimated cost of the houses and shops was 785,950*l.*; alterations and additions, 241,310*l.*; and public buildings and warehouses, 248,185*l.* In addition, 21 new streets had been made. The total number of linings passed was 623—an average of 26 at each Court. The number of new houses erected in 1894 was in excess of any year since 1876.

Illustrations.

ST. JOHN'S CRYPT, CLERKENWELL, E.C.

THIS fine crypt is practically all that remains of the Mediæval Church of the Priory of Knight Hospitallers of St. John of Jerusalem at Clerkenwell. It was the chief home of the order in England, and its Prior ranked as first Baron of England.

Until a few weeks ago its architectural beauties were quite hidden, the side aisles and transept being filled with the human remains of parishioners of the present and last centuries, and the floor of the nave covered with a mass of earth almost 2 ft. in thickness in which interments had also been made. Owing to the dreadfully insanitary state of the crypt an Order in Council was made for the removal of the remains to Woking Cemetery, which has just been complied with, and a beautiful and interesting piece of Gothic London is recovered.

The crypt now consists of a nave of five bays, a transept at the extreme east end, and two aisles, that on the south having two finely-vaulted bays. The north aisle is formed by two chambers with plain barrel vaults, and entered by a doorway out of the north transept. The three western bays of the nave are Early Norman, round-arched in character, and must have formed a small church before the Knights of St. John came to Clerkenwell, about the year 1100 A.D. The two eastern bays of the nave, together with the transepts and south aisle, have pointed-arched groining springing from triple-clustered columns of Transitional character. This portion appears to have been built to sustain the choir of the Priory Church, which was erected above it, and consecrated in the year 1185 A.D. by Heraclius, Patriarch of Jerusalem, who also consecrated the Temple Church, in which he was buried.

Much of the original colour-decoration still remains on the arches of the nave; it is a simple ornament of half-circles in a red pigment, and a chevron design in thin raised plaster running along the ribs of the groins. Round the earlier portions of the nave is a stone bench, forming a seat, and at the western end one jamb of the original doorway can be seen, with three steps leading down to the floor; this would appear to have been the original difference of level between the ground outside and inside, although now it is considerably below the outside level. It was originally lighted by small narrow shaped windows in each bay, and some of the iron stays and bars are still in their place; and iron rings, from which the means of artificial lighting was probably hung, remain in the centre of the arches.

It was this crypt which was visited in 1762 by Dr. Johnson and other gentlemen, during the excitement about the famous "Cock-lane Ghost," which had promised to knock on the coffin of "Mistress Fanny." W. M.

DESIGN FOR NEW HOUSES OF PARLIAMENT, TOKIO, JAPAN.

THE selection by the Japanese of German architects for all their new public buildings seems at first sight rather surprising. That this Europeanising nation should have been so ready to adopt ideas from the German army and the English navy is natural enough, but one would have expected that if they wished to Europeanise their architecture they would have gone to Paris rather than to Berlin. If we are rightly informed, however, the question was settled on considerations of diplomacy rather than of art, and there were political motives for the importation of German architects.

On April 15, 1893, we illustrated the new Law Courts at Tokio, showing both the design carried out and the one originally intended, which varied in accordance with the special tastes of political parties, who, on the one side, wished to imitate Western architecture entirely, and, on the other, were satisfied with appropriate adaptations. In the present number we publish a plan and a perspective of the design for the new Houses of Parliament which are being erected at the same place. The plan is being carried out on the lines here shown, but we understand that the architectural design is likely to be somewhat modified in adaptation to its surroundings. This, we suppose, means that the design will be given that curious dressing which we will term a Japo-Italian Renaissance, a good idea of which was given in one of our plates of the above-mentioned Law Courts. The architects, Messrs. Ende & Boeckmann, of Berlin, at first had a large staff of assistants at Tokio; these have now been paid off, and the firm has received due intimation that the designs purchased would be amended and carried out under native supervision, only one of the German staff remaining on the spot to act as adviser. One is naturally curious to see the result of this experiment.

The design we illustrate practically shows a block which would serve the purposes of any European legislative body with a large "Upper" and "Lower" House. As in the case of Professor Steindl's Budapest Houses of Parliament (see *Builder*, August 25) the architect's programme required the two houses to be treated as if of identical importance. Though there is a considerable difference in the number of seats in the council chambers of the Lords and Commons, their dimensions were to be the same, and both halls were to be equally conspicuous from without. Each house was to have a spacious *salle des pas perdues*, and there was to be a large central hall with a grand staircase for ceremonial purposes.

The plan, which explains itself, is certainly free from all complications, and the Lords' and Commons' wings, which are on either side of the central hall, are exact *fac-similes*. The main floor of the building is only a few steps above the road-level, and on passing the porter's boxes the visitor at once finds himself in the central hall. In front of him is the grand staircase which leads to the committee-room floor. On either side there are the *salles des pas perdues*, which, together with the cupola, form a most imposing *ensemble*. The total length of the combined *salles* is 100 mètres, and the cupola has a diameter of 20 mètres. Both chambers measure about 30 by 20 mètres, exclusive of the gallery accommodation, which is in loggias outside the actual area of the floor. There is ample passage-room, and each chamber has a large library and dining-room. At the farther end of each wing are the Speaker's offices, Minister's studies, and the press rooms. Two stairs in each case lead to a separate business entrance on the basement level, and at the same time facilitate communication with the upper floor. Off a long passage at the back there is a row of offices, most of which are used for committee purposes.

The upper floor, as already implied, is practically entirely devoted to committee-rooms, the dimensions of which vary from 5 by 7 mètres to 10 by 22 mètres. At the head of the grand staircase there is, however, also a reception-room for the Mikado. The loggias to the chambers have their approach from this floor, and the press has a number of rooms. The loggias have their own staircases for public use, and there are some service staircases besides. As regards the basement, this part of the building is only used for offices.

As to the architecture, it also practically explains itself. The so-called "Italian" Renaissance style of the Berlin school has been adopted, and there is a severe columnar treatment. The whole feeling is essentially German and academical, the dome alone (which we hope is "earthquake-proof") showing some originality. The materials to be used will be native free-stone, as far as possible. A number of Japanese workmen have been in Europe learning the different trades, especially masons' work.

The House of Parliament is only one of the numerous blocks which Messrs. Ende & Boeckmann designed for the Mikado's Government. Besides the Imperial Law Courts, which we illustrated, the most important of these are the Ministry of Justice, the Admiralty Office, and the Japanese "Scotland Yard." Both partners of the firm alternately visited Tokio, and Herr Boeckmann has very ably described his adventures and the difficulties encountered in the form of a "diary," published for private circulation. The late Herr Köhler and Herr Hartung were the chief assistants in charge of the work. Herr Seel, Messrs. Ende & Boeckmann's clerk of works, remained in Japan to act as adviser.

The Legislative bodies were first temporarily housed in a miniature wooden block erected from the same plans. This was burnt down in 1891, and then re-erected.

ENDALLS MANOR, WARGRAVE-ON-THAMES.

THE illustration shows the entrance-front to a house recently erected at Wargrave-on-Thames, Berkshire.

The entrance-porch and upper floors are in half-timber work and tile-hanging, all the timber-work being in oak. The remainder is in red brick and stone dressings. The tower has an extensive look-out, and contains the cisterns in the upper part.

The contractors were Messrs. J. Bottrill & Sons, of Reading. Mr. John Belcher is the architect.

THE GREAT HALL AND STAIRCASE, HURSTBOURNE, HANTS.

WE illustrate this week interior views of the Great Hall and Staircase of this Mansion, exterior views of which we published in our issues of November 11, 1893, and January 27, 1894.

It is proposed to execute the whole of the woodwork in oak, and to adapt certain old panelling, which has been acquired by Lord Portsmouth, for lining the walls.

The ribs and pendants of the ceiling will also be of oak, the spaces between the ribs, as well as the soffits of stairs, being filled with heraldic and other devices in *carton pierre*.

As before stated, the majority of the work is being executed by Lord Portsmouth's own workmen on the spot.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

Paddington Sewers.—With reference to an application from the Vestry of Paddington for the loan of 20,000*l.* on the annuity system, for twenty years, for special sewer works, the Finance Committee reported that:—

"Towards the end of the year 1890 the Vestry of Paddington invited tenders at a schedule rate for the execution of special works and repairs to a large number of old sewers in the parish. The works consisted chiefly of the construction of new inverts to old sewers, and up to December, 1893, seventy-two sewers had been partly reconstructed at a cost of 20,882*l.* 14s. 6d., which has been paid for out of current rates. The vestry now desires to construct about 26,663 ft. run of new inverts to eighty-six old sewers, and to execute some slight repairs and pointing to a length of 8,925 ft. of sewer at an estimated cost of about 21,997*l.* and 627*l.*, making together 22,624*l.* It is a serious question (as it would form a precedent) whether the vestry should be allowed to borrow money for works of maintenance and repair to existing sewers, the expenditure for which should be, and, as far as we are aware, always has been, defrayed out of rate."

The report, however, after the statement of some facts bearing on the subject, concluded with the recommendation that:—

"For the sake of the public health the request of the vestry for a loan to carry out at once the remainder of the works should be acceded to, but that the period for repayment should be limited to five years, that being about the time by which the works would have been completed under the resolution of the vestry to expend 5,000*l.* per annum upon these special works."

A recommendation in accordance with the report was agreed to.

Battersea Public Baths.—On the recommendation of the Finance Committee, an application by the Commissioners for Public Baths and Washhouses for the Parish of Battersea, for a loan of 5,000*l.* to defray the cost of constructing an additional swimming-bath and other works, was granted, on condition that interest at the rate of 3*l.* 10s. per cent. per annum be paid quarterly, and that the principal be repaid by equal annual instalments within a period of thirty years.

Plans of Improvement Schemes.—The General Purposes Committee recommended, and the Council agreed, that the following be a standing order of the Council:—

"Whenever a committee resolves to bring up to the Council a scheme involving the acquisition of land at a cost exceeding 1,000*l.*, a cartoon plan of the scheme shall be prepared in the proper department and hung in the Council chamber."

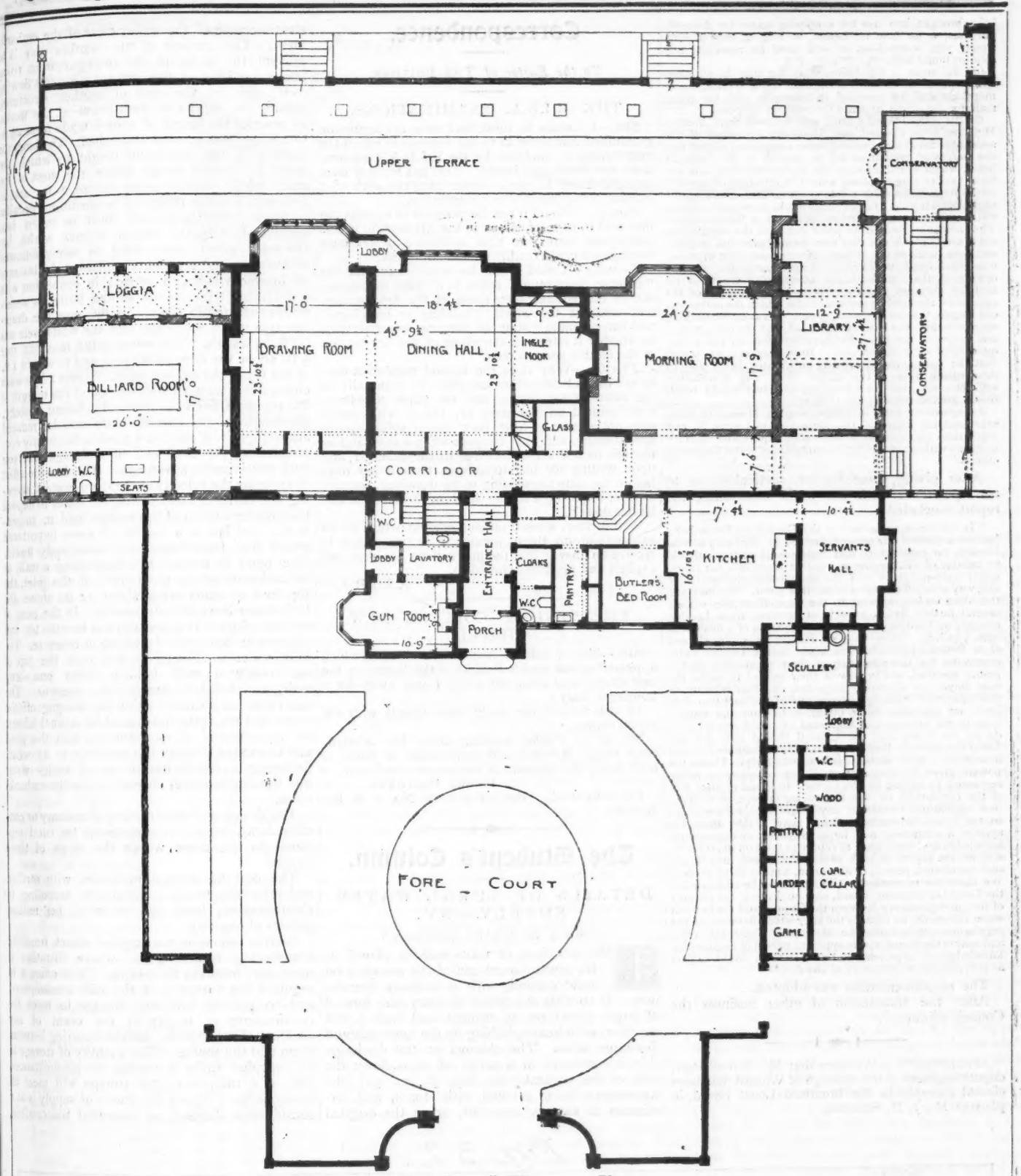
Cleansing Gullies of Main Sewers.—The Main Drainage Committee made the following report:—

"Under Section 16 of the Council's General Powers Act, 1894, the duty of cleansing every grating and gully in any street communicating with any sewer of the Council (except in streets vested in and cleansed by the Council) so far as such grating or gully belongs to or is under the control of the Council, shall as from the passing of the Act be transferred to the vestry of the parish or the board of works for the district within which the same is situate. Hitherto the gullies connected with the main sewers on the north side of the Thames have been under the control of the Council, and the Council has undertaken the cleansing and removal of the slop from them. On the south side of the Thames all gullies connected with the main sewers have, in accordance with an arrangement made about twenty-five years ago, been under the control of the local authorities, and cleansed and repaired by them. We recommend—'That the local authorities of the districts on the north side in which there are gullies connected with the main sewers be informed that after the end of this year the Council will cease to undertake the cleansing of them, and that the duty will from that time devolve upon the local authorities as provided by Section 16 of the Council's General Powers Act, 1894.'"

The recommendation was agreed to.

Tower Bridge (Southern Approach) Bill.—The Parliamentary Committee recommended—

"That it be referred to the Parliamentary and Improvements Committees to consider and report to the Council



"Endalls Manor," Wargrave.—Plan.

what further steps they deem it advisable that the Council should take in connexion with the Tower Bridge (Southern Approach) Bill."

In their report the committee stated that :—

"It is of the greatest importance to obtain a decision of the House of Commons as to whether or not all future schemes involving 'betterment' are to be subjected to the condition as to compulsory purchase, or indeed to any of the conditions imposed by the Select Committee of the House of Lords, and in our opinion the only method whereby such a decision can be obtained will be for the Council to bring in again precisely the same bill in the form in which it left the House of Commons. We understand that it has been suggested that some other route or routes might be preferable to that adopted by the Council. So far as these other routes have been specified, we are advised that the construction of them would be far more expensive than the Council's proposal, and not of greater utility. But apart from this consideration we must point out that any proposal involving a new route would require lengthy consideration by the Council and its Committees, and great labour by its officers in the preparation of plans and estimates, so that it would be most difficult to put before Parliament in the ensuing session any properly matured scheme. . . . . We think that it would be well if the Council would refer to the Improvements Committee and ourselves to report jointly thereon."

Mr. Antrobus moved as an amendment that the following words be added to the report :—

"The Council regrets that under all the circumstances of the case, the Parliamentary Committee did not carry through the Bill under the proposal of the Select Committee of the House of Lords."

Mr. Reed seconded the amendment, which, on a division, was rejected by 63 votes to 26.

Mr. Howell Williams proposed that the inquiry should also include the question of route.

This proposition was accepted, and the recommendation was then agreed to.

Boundary Street Improvement Scheme.—The Public Health and Housing Committee, in submitting the working drawings, specifications, quantities, and estimate for the foundations of the buildings proposed to be erected on Section B of the area comprised in the Boundary-street improvement scheme, reported that they had carefully considered the question of the cost of the superstructure, having regard to the Council's resulution of 21st March, 1893, requiring a return of 3 per cent. on building operations of this nature, and were satisfied that this resolution would be complied with. The estimated cost of the foundations was 6,210*l*. The Committee were of opinion that the work should be executed by the Works Department.

It was resolved—

"That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, the working drawings, specification, bills of quantities and estimate for the foundations of the buildings to be erected on section B of the area comprised in the Boundary-street improvement scheme be approved, and be referred to the Works Committee."

Water Companies' Regulations.—The Public Health and Housing Committee reported that in accordance with the resolution of the Council of January 30 last, they addressed communications to the London water companies in February, asking them to make the following alterations in the regulations made under the Metropolis Water Act, 1871, viz. :—

"(*a*) To amend regulation No. 21 so as to read as follows :—

'Every water-closet cistern or water-closet service box hereafter fitted or fixed in which water supplied by the company is to be used shall have an efficient waste-preventing apparatus, so constructed as not to be capable of discharging more than *three* gallons of water at each flush.'

(*b*) To amend the regulations so that the requirements as to the supply of water to water-closets shall apply equally to the supply of water to sinks used for receiving any solid or liquid filth.

(*c*) To make a regulation which will prevent cisterns

being brought into use for supplying water for domestic purposes, or for food for beasts, so long as they directly supply any water-closet or sink used for receiving any solid or liquid filth.

(*d*) To make a regulation requiring that in all cases where any premises have a constant water service, one or more taps shall be provided in connexion with the rising main for the supply of water for drinking purposes.

On the 16th of April a reply was received from Messrs. Hollams, Sons, Coward, and Hawksley on behalf of the seven associated metropolitan water companies, stating that the suggested regulation (*a*) as quoted in the Council's letter, which would increase the authorised flush of water from two to three gallons raised a question of general public importance, for it would cause an enormous addition to the consumption of water and entail increased expense to the public as regards the requirements of future supply. The companies desired to point out that the regulations made under the Act of 1871 were framed after full inquiry, and were based on the evidence of very competent witnesses who considered two gallons amply sufficient. In the opinion of the companies the adequacy of the flush for sanitary purposes depended on the construction of the apparatus, the head or pressure under which the water was discharged, the size of the down pipe "between the flushing apparatus and the basin of the closet, and the construction and shape of the closet-basin, rather than on the actual quantity of water discharged." In conclusion it was stated that the companies confidently anticipated being able to demonstrate that a two-gallon flush was abundantly sufficient, and that no advantage whatever would result from a greater consumption of water.

As regards the other matters referred to, Messrs. Hollams expressed the desire of the companies to concur in any regulations which might be reasonably required for sanitary purposes without involving consumption of water for useless objects."

After giving some further particulars as to correspondence with the water companies, the report concluded:—

"In our report presented to the Council on December 5 last we expressed our reasons, arrived at after very careful inquiry, for considering that water-closet cisterns should be capable of discharging a 3-gallon flush, and our subsequent correspondence with the water companies has not in any way affected our opinion on this point. We may add that since we last reported to the Council on this subject several further letters have been received from London sanitary authorities urging the desirableness of a flush of at least 3 gallons. More than six months have now elapsed since formal application was made to the London water companies for the alteration of their regulations in the points specified, and in view of their refusal to make the most important alteration suggested, viz., that relating to the capacity of flushing cisterns, and of the fact that they have not intimated their intention to alter the regulations in the other points suggested or taken any steps to do so, we think that the Council should now ask the Local Government Board to proceed in the manner directed in section 19 of the Metropolis Water Act, 1871. Under the powers given by that section, if any company on being requested in writing by the Council to repeal or alter any of the regulations for the time being in force, or to make new regulations instead of any of the same, refuses to do so, the Local Government Board may, if they think fit, appoint a competent and impartial person of engineering knowledge and experience to report to them on the subject, and on the report of such person the Board may make such regulation, repeal, or alteration, as they think proper. We therefore recommend—'That a letter be addressed to the Local Government Board, communicating the purport of the correspondence between the Council and the London water companies as regards the suggested alteration of the regulations made under the Metropolis Water Act, 1871, and asking the Board now to appoint a person of engineering knowledge and experience to report to them on the subject as provided for in section 19 of the Act.'"

The recommendation was adopted.

After the transaction of other business the Council adjourned.

APPOINTMENT.—We learn that Mr. Nowell Parr, deputy engineer of the borough of Walsall, has been elected surveyor to the Brentford Local Board, in place of Mr. J. H. Strachan.

Correspondence.

To the Editor of THE BUILDER.

THE R.I.B.A. EXAMINATIONS.

SIR,—I venture to think that there are legitimate grounds of complaint as to the manner in which the instructions to students for the R.I.B.A. Examinations are drawn and issued. This has forcibly been brought home to me in supervising the work of a student preparing for the Examination.

Firstly.—Would it not be possible to express the first and third instructions in the Art Section in less ambiguous terms, so that a person of ordinary intelligence could readily understand them?

Secondly.—Could it not be made clear what the "concise description" refers to? This instruction occurs immediately after those of the Art Section, and contains the words "building or buildings," and leaves one in a state of pleasing uncertainty as to whether it refers to the whole of the Art Section or the Gothic portion only.

Thirdly.—Why does the second regulation contained in the Science Section differ so materially in the calendar for 1893-4, and the paper of Instructions printed on February 11, 1894? This paper does not appear to have been issued voluntarily to probationers, and what happens when a student, like the one named above, adheres to the calendar, and upon writing for his application form a few days before the date for sending in his drawings, receives a paper requiring a totally different sheet to the one he has done?

And further, when a puzzled student writes for an explanation on these points, it is very hard to receive an answer that the instructions are clear and explicit and must be adhered to.

A.R.I.B.A.

CHELTENHAM COLLEGE NEW CHAPEL.

SIR,—May I add a line to the notice which appeared in last week's *Builder* of the bosses in the new chapel, and came out while I was away for a holiday in Italy?

In such designs the credit rests largely with the actual carver.

Mr. R. L. Clarke, working under Mr. Martyn, from rough sketches and instructions of mine, is more really the designer of the bosses than I am.

HENRY PROTHERO.

P.S.—By-the-by, the subject of No. 7 is the Nativity.

The Student's Column.

DETAILS OF RURAL WATER SUPPLY.—XV.

STORAGE OF WATER (*continued*).

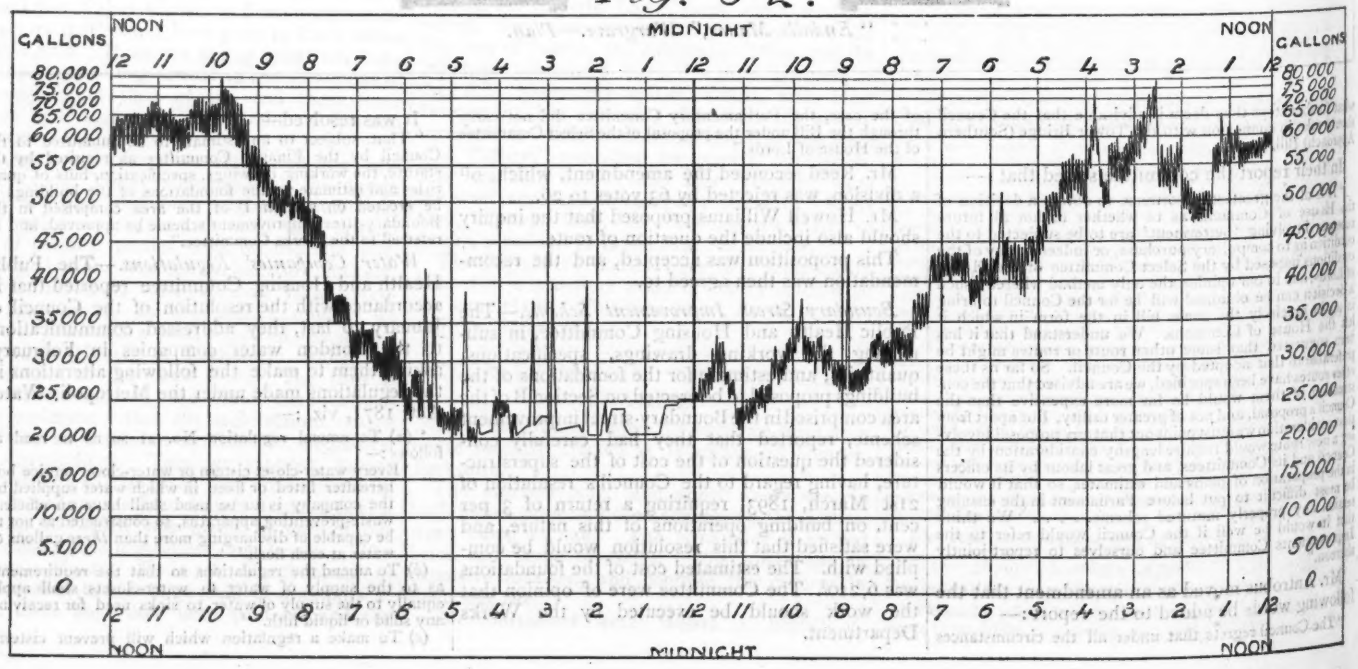
THE overflow or waste weir is placed at the embankment end of the reservoir on solid ground, with a concrete foundation. It consists of a heavy masonry base formed of large stones set in cement and well keyed together, with heavy pitching on the approach and discharge sides. The channel on the discharge side is continued in a series of steps down the side of the embankment (figs. 30 and 31) (the watercourse being pitched with stone), and terminates in another reservoir, or in the original stream-course of the valley clear of the embankment. The purpose of the overflow-weir is to prevent the water in the reservoir from rising above the level of the embankment and flowing over, and, in the case of earthen structures, causing the inevitable destruction of the works. In practice the length of weir is made from 2½ ft. to 4 ft. per 100 acres of watershed. The length is limited by the maximum height to which the water is allowed to rise above the crest of the weir, which should never exceed 2 ft., and is generally fixed at 18 in. The conditions peculiar to each gathering-ground must be taken into consideration in the design of such works, but the rules given above may be safely followed where no storm records are available. An instance of insufficient length of weir in connexion with the Tittesworth reservoir of the Potteries waterworks occurred in 1862. In this case the drainage area was 6,800 acres, and the waste-weir was 60 ft. in length. The water in the reservoir rose 5 ft. above the crest of the weir and to within 1 ft. of the top of the embankment. Where a bye-wash channel has been constructed round the margin of the reservoir, from the inlet, of sufficient capacity, the length of the overflow weir may be reduced accordingly. A residuum pond is frequently constructed at the inlet end of a storage reservoir with considerable advantage. This has the effect of reducing the velocity of the storm waters, arresting any detritus, and allowing the water to deposit the greater portion of the matter held in suspension. The last is a matter of some importance where the storm waters are exceedingly turbid. The pond is formed by constructing a wall or embankment across the mouth of the inlet, the top level of which being about 12 in. above the high-water level of the reservoir. In the case of an embankment it is necessary to face the top and slopes with heavy stone pitching or concrete. The inlet water is allowed to rise over the top of the residuum wall (which forms one long weir), and fall into the storage reservoir. The pond may be cleansed either by drawing off the water and removing the deposit by manual labour, or by means of pipes connected with the pond and continued through the reservoir to its outlet, delivering a continuous stream of sludge water into the original river channel below the embankment.

The design and construction of masonry or concrete dams, being rarely necessary for rural supplies, do not come within the scope of these papers.

The cost of storage reservoirs with earthen embankments varies considerably, according to circumstances, from 70*l.* to 900*l.* per million gallons of capacity.

Service reservoirs are supplied direct from the impounding reservoir, or, where filtration is necessary, from the filter-beds. Their office is to regulate the variation in the daily consumption, and to provide sufficient storage to meet the requirements of supply in the event of any accident of a temporary nature occurring between them and the source. The quantity of storage to be provided varies according to circumstances, but, as a rule, two days' storage will meet all emergencies. Where the source of supply is at a considerable distance, or somewhat inaccessible,

Fig. 32.



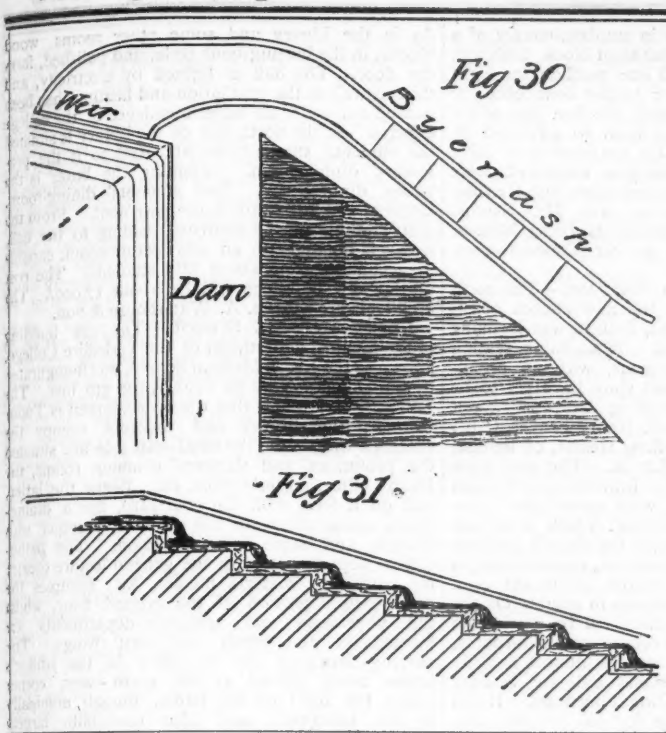


Fig 30

Fig 31

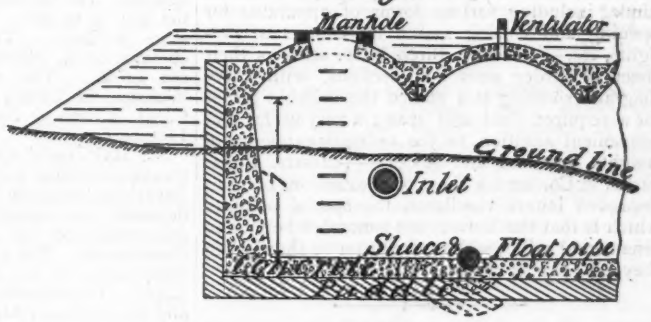


Fig. 34.

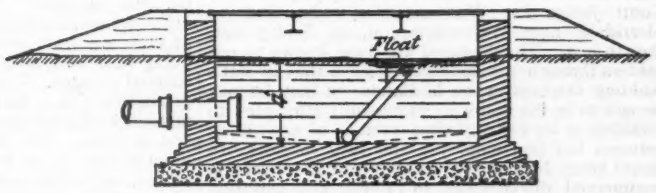


Fig. 35.

and where there is a single main, or, in the case of a pumping supply, where there are no duplicate arrangements, it would be prudent to increase the storage capacity of the reservoir so as to make provision in the event of a break-down.

In order to enable the student to form an idea as to the variation during the day, the accompanying diagram (fig. 32), is given, which is taken from a Deacon Differentiating Meter. This diagram shows graphically the daily variation in a manufacturing town of 48,258 inhabitants, and may be taken as a fair example. The abrupt rises and falls shown on it between 2 and 6 a.m. are due to the supply to locomotives during those hours, the waste line or minimum flow being equal to 20,300 gals. per hour, which is chiefly due to defective fittings. The total consumption, including domestic and trade supply, per head of population is equal to 19·85 gals., and the minimum flow 10·09 gals. per head, or practically one-half of the supply.

The variations of supply during the different periods of the year are not so great as might be anticipated. The householder's favourite practice of allowing the taps to run during frosty weather and the number of burst pipes have the effect of raising the consumption in the town referred to frequently up to, and in excess of, the summer months. The following table gives the consumption per head per day for the last four years:—

Gallons per head per day.

Month.	1890.	1891.	1892.	1893.
January	19·77	29·30	23·26	28·50
February	19·57	23·26	21·24	23·43
March	20·38	21·54	22·53	22·75
April	18·95	20·38	23·11	23·14
May	20·99	21·06	23·39	22·11
June	20·81	22·50	23·31	23·25
July	21·05	23·62	22·90	21·69
August	21·79	21·66	21·73	20 63
September	21·40	22·13	21·72	18·78
October	21·10	22·13	22·08	20·08
November	20·58	21·30	21·26	21·91
December	24·21	23·54	23·29	19·90

The site for a service reservoir should be at a sufficient elevation, and within the immediate vicinity of the district to be supplied. It is usually constructed either of masonry, brickwork, or concrete, and roofed over; or by excavation and embankments lined with concrete and pitching and left open. It is absolutely necessary to cover the service reservoir when near a town or manufactories to prevent contamination, and especially so after filtration. Service reservoirs are only left uncovered when situated at some distance from any smoke or fumes from chemical or other works, and in such cases the depth must not be less than 10 ft., which may be increased with advantage so as to prevent the growth of vegetable matter which produces that peculiar fish-like smell so common in shallow reservoirs. Figs. 33A and 33B are examples of open reservoirs, and fig. 34 of a covered reservoir. Covered reservoirs should always have at least 2 ft. of earth above the roof to keep the water as cool as possible, and ventilators should be fixed in the crowns of the arches. It is an advantage to have a wall dividing the tank or reservoir into two portions for the purpose of cleansing from time to time.

Collecting-tanks are used for storing the water from springs, and fulfil the offices of impounding reservoirs on a small scale, to which the duty of a service-tank is frequently added. These tanks are constructed of masonry, brickwork or concrete, either with arched roofs, as in fig. 34, or covered with iron plates supported by girders (fig. 35).

The cost of covered service reservoirs varies from 2*l.* to 6*l.*, and of open reservoirs from 1*l.* per 1,000 gallons.

The usual accessories to a service or collecting reservoir, containing from 5,000 gals. to 50,000 gals., are the inlet and outlet, overflow and wash-out or scour-pipes. The inlet-pipe should be so arranged that the inflowing water may be shut off or diverted from the reservoir when the latter is being repaired, &c. The mouth of the inlet-pipe is usually fixed slightly above the level of overflow. The outlet should be a few inches above the level of the floor of the reservoir, so as to allow for a certain amount of deposit from the water. Its mouth should be covered with a perforated cap, rose, or strainer, which is best constructed of tinned copper. The outlet should be commanded by a sluice-valve, fixed inside the reservoir, worked from above by a wheel and spindle. The supply from a reservoir is sometimes taken by means of a floating pipe (fig. 35). This ingenious method allows of the water being always taken from a little below the surface, which is the clearest portion of the water in a reservoir. The overflow pipe is either a pipe taken through the wall of the reservoir with its mouth at the highest point to which the water is to be allowed to rise, or it may consist of a vertical pipe carried through the floor of the reservoir, having a trumpet-mouth for receiving the overflow water. In the latter case the pipe should be constructed of copper. The wash-out, or scour-pipe, has its mouth situated at the lowest point of the floor of the reservoir, which should be made to slope towards it. It should be large enough to empty the reservoir rapidly, and must have its outlet below the level of the floor of the reservoir. It may either be controlled by a sluice-valve worked from the surface, or in small tanks by means of a brass plug and chain. In small tanks the overflow and wash-out are sometimes combined, the foot of the vertical overflow pipe being ground into the mouth of the wash-out; by loosening and lifting the overflow pipe the water is free to escape through the wash-out. Iron steps should be built into the wall of the reservoir to allow of access to the interior.

The inner surface of the reservoir should be rendered with cement, which should be brought to a perfectly smooth surface with the trowel.

Where the supply is obtained from springs, it is usually necessary to collect them by means of stoneware pipes with open joints covered with broken stone. These pipes are connected by means of close-jointed pipes, and conveyed to a small tank, from whence they are conducted to the reservoir. Great care must be taken in collecting springs to avoid all chance of pollution.

TRADE CATALOGUES, &c.

Messrs. Hayward Bros. & Eckstein send a circular in regard to their "Safford" Radiators, for which they claim certain advantages in soundness of construction, especially as to jointing by the use of a patent screw-nipple, which draws the joints together tightly. Each loop of the radiator is tested to a pressure of 120 lbs. to the square inch, and the whole assemblage of loops when put together are again tested to the same pressure. If the framers of catalogues of this kind of practical article would dispense with the designs which they call "ornamental," they would do better for their own interests, in the eyes of architects at all events.——The General Iron Foundry Company send us their illustrated catalogue of lavatory stands (which would be far more attractive to people of taste if they were less bedizened with what is supposed to be "ornament"); baths, of which the same might be said, but which appear (the plainer ones) to be good baths at moderate prices; water-closet basins, including one which is called the "County Council Closet," and is fitted with a lead thimble for connexion with the lead pipe by a wiped joint; water-waste preventers, sinks, &c.——Messrs. Hobbs, Hart, & Co. send us their catalogue of safes and strong-room doors, which is very fully illustrated not only with ordinary advertisement representations but with constructional drawings showing the method of building in strong-rooms, and with complete descriptions of the construc-

Fig 33 (a)

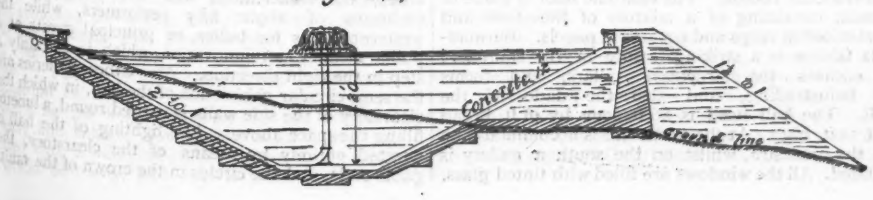
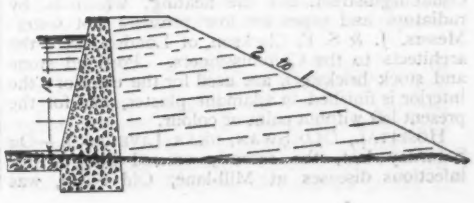


Fig 33 (b)



tion. The catalogue will be very useful to architects of buildings where strong-rooms are required.——Messrs. Hart, Son, & Peard send us an illustrated catalogue of their lock and door furniture, inlet ventilators, hinges, bolts of various kinds, including various forms of apparatus for opening and closing sashes on centres in sky-lights, &c.——Messrs. Birch & Co. send us their sheet of girder sizes and sections, with curve diagrams showing at a glance the suitable girder for a required load and span; a very useful and convenient addition to the ordinary catalogue of weights, sections, and prices.——Messrs. Edgar Fisher & Co. send a sheet of illustrations of their improved louvre ventilator, the special point of which is that the louvres are concealed behind an ornamental grille, with an indicator to show when they are open or closed.

OBITUARY.

Sir Rupert Kettle.—We regret to record the death of Sir Rupert Kettle, for many years County Court Judge for Worcestershire, who died at Merridale, near Wolverhampton, on Friday last, the 5th inst. The deceased was best known to our readers through his endeavours since 1865 to settle building disputes in the Midlands—in fact, he may be said to be the first who successfully attempted to establish a legally organised system of arbitration between building employés and their masters. In recent years he has frequently acted as referee in commercial disputes and in railway compensation cases arising in the mining and iron manufacturing districts.

GENERAL BUILDING NEWS.

Church, Abergwynfi, Glam. — The new church of St. Gabriel, Abergwynfi, was opened by the Bishop of Llandaff last week. The building is situated upon the side of a hill overlooking the Rhondda and Swansea Bay railway stations. Owing to the nature of the site it was found impracticable to construct an aisle; hence a gallery supported by stone arches was erected. The church is in the Early English style, having lancet windows of unusual height. The external dressings are of hard Doulting stone, the interior fittings being of pitch-pine. It has cost about 2,600*l.*, apart from the excavation of the site, which added another 500*l.* The architect was Mr. G. E. Halliday, the Diocesan Surveyor for Glamorgan, and the contractor was Mr. Gaylard, of Bridgend.

Church Schools, Wetherby, Yorks.—The foundation-stone of the church schools now in course of erection at Wetherby was laid the other day. The buildings were designed by Mr. A. A. Gibson, architect, Harrogate, and will cost about 1,300*l.*, exclusive of land. Mr. G. B. Thain, of Wetherby, is the contractor for the works.

Public Library, Poplar.—The new library buildings have been opened for public use. The site originally proposed was abandoned; and one bought in the High-street, with a frontage of about 100 ft. by a depth of a little over 100 ft. All the rooms to be used by the public are on the ground floor, and skylights have been avoided throughout, windows at various levels being used. About a fifth of the whole building, as designed, has yet to be completed; the hall, intended to be put on the north-west portion, not having been carried out from want of funds. This hall was planned to seat over 200 persons for lectures, &c., and so arranged that it could be appropriated for the use of educational classes in connexion with the work of the library. The lending library is the public room, placed nearest to the front, so that readers in the rooms at the back may not be disturbed by the noise of the constant traffic of comers and goers. The public space is 20 ft. by 10 ft. 6 in. Behind the counter are bookstores for about 40,000 volumes. The news-room, for 120 readers, occupies the south-east portion, and the reference-room, for about the same number, the rest of the back of the site; the reference-room is thus the quietest part of the building. The lighting in both rooms is by windows at a low level in a sort of aisle 11 ft. high, and by windows on each side of the tall portion of the room, the ceiling in which is about 22 ft. 6 in. from the floor level. The librarian's house occupies the one and two pair stories of the tall front central block. Messrs. McCormick, of Canonbury, are the contractors, and Mr. H. G. Rogers, the clerk of works. The gas lighting is by Wenham ventilating lamps, the whole of the products of combustion being carried away, so that the bindings of the books are not injured, and the heated pipes stimulate the extraction of air from the rooms. Messrs. Strode & Co., of Osnaburgh-street, did the heating, which is by radiators and pipes for low pressure hot water. Messrs. J. & S. F. Clarkson, of London, were the architects to the Commissioners. Portland stone and stock brickwork are used for the exterior; the interior is finished in adamant plaster, and for the present left without paint or colour.

Hospital, Old Swan, near Liverpool.—On Saturday last, the recently-erected hospital for infectious diseases at Mill-lane, Old Swan, was opened. The buildings, six in number, consist of a porter's lodge on the administration block, bath and dressing block, laundry, and one pavilion for eight beds and two pavilions for twelve beds each, or thirty-two beds in all for this, the first part of the scheme. The buildings have been so arranged on the site as to leave room for the erection of three more pavilions. The materials employed were common brick, relieved here and there with Ruabon red bricks. The contractor was Mr. Samuel Webster, of Bootle, the architects being Messrs. C. O. Ellison & Son, of 22, Sir Thomas-street, Liverpool.

St. Barnabas' Church, Belfast.—The north transept recently added to the new church of St. Barnabas, Duncairn Gardens, Belfast, was formally dedicated on Saturday last. It contains seating accommodation for 360 persons, with an organ-chamber, &c. The tower and spire have yet to be completed; so far, the building has cost about 3,000*l.* The architect is Mr. Henry Seaver, C.E., and the contractor Mr. Matthew Hearst, of Belfast.

New Church Halls, Leith.—The new halls erected in connexion with the Junction-road United Presbyterian Church, Leith, were opened on Thursday, the 4th inst. The building, which is to cost about 3,000*l.*, is situated behind the church, and has an entrance from Bonnington-road, communication being also had with the church by means of a covered passage. It is two stories in height. On the ground floor is a hall in which will be carried on mission work, with a session room, two cloak-rooms, and kitchen. The floor above, is almost entirely monopolised by a commodious hall for Sunday school, and other congregational purposes. It will afford sitting accommodation for 500 people. Mr. P. L. Henderson was the architect, Mr. John Thynn contractor for the masonry, Mr. J. Fisher for the joiner's work, and Messrs. J. & T. Harvey, Edinburgh, for the painting.

Technical School, Darwen, Lancs.—A new building, which is to serve the purposes of a technical school, free library, and science and art school, was opened in Darwen on Saturday last. It is a large stone-built structure of three stories, and has cost about 14,000*l.*, including the site. The architect is Mr. J. Lane Fox.

Cottage Almshouses, Burnhead, near Liberton, N.B.—The Lord Provost of Edinburgh has opened a number of cottage almshouses, recently erected at Burnhead, from the designs of Messrs. M'Whannel & Rogerson, architects, of Glasgow. The buildings are semi-detached, and each consists of three rooms and kitchen, with baths. The cost of the whole was between 5,000*l.* and 6,000*l.*

Durham College of Science, Newcastle-on-Tyne.—On Tuesday last, the 9th inst., the new south-east and south-west wings of the Durham College of Science, Barras Bridge, Newcastle, were inaugurated. The plan upon which the edifice was originally designed provided for a quadrilateral range of buildings enclosing a court-yard. Of the four wings, the first—the north-east—has been open for some years. This comprises the chemical and physical lecture-rooms and laboratories, museums, preparation-rooms, &c., and in it the whole work of the college has since been carried on. The second and third wings are the ones just completed. These include the whole of the apartments to be devoted to the study of engineering and the fine arts. The finest of the rooms is the "George Stephenson" engineering laboratory; it is 123 ft. long by 35 ft. wide, and is supplemented by an annexe 9 ft. wide for the greater part of its length. The portion of the college yet to be built is the main wing, to include the administrative, literature, and agricultural departments, facing the Castle Leazes. The architects for the buildings have been Mr. Johnston, F.S.A., and Mr. Frank W. Rich. The contractors have been as follow:—Joinery, Mr. J. E. Middlemiss; steel-work for the floor, girders, and roof principals, Messrs. Dorman & Long, Middlesbrough; plumbing work, Mr. Mansfield Gibson, Newcastle; steam heating, Messrs. Dinning & Cooke, Newcastle; decorative work, Messrs. J. Richardson & Co., Newcastle; plastering, Mr. W. Ferguson; tiling, Mr. C. Nicholson.

The Yorkshire College Hall, Leeds.—On Friday, the 5th inst., a new hall of the Yorkshire College was opened by the Duke of York. It is in the Perpendicular Gothic style. The central gable rises about 75 ft. above the ground level, and the two towers are 100 ft. in height. The porch giving access to the hall is one of the two principal entrances shown in the architect's complete design. The other will be in the portion of the buildings yet to be erected. On the ground floor is the library, about 48 ft. square and 22 feet high, adjoining which is a large book-store. On the one side of the vestibule is a corridor leading to the Baines Memorial Wing, and on the other a corridor giving access to the Engineering Department, and to the dining-rooms and students' rooms. The vestibule floor is made of mosaic, consisting of a mixture of limestone and marble laid in strips and squares in panels. Burmantofts faïence is a striking feature of the staircase; it encases the structural pillars, and forms the balustrading, and also the dado of the wall. The hall itself is 86 ft. long by 48 ft. broad and 32 ft. high. At the north end is accommodation for the orchestra, whilst on the south a gallery is situated. All the windows are filled with tinted glass. As in the library and some other rooms, wood blocks, in the herring-bone style, and polished, form the floor. The hall is lighted by electricity, and this, as well as the ventilation and heating, has been carried out under the superintendence of the college experts. At the north end of the library is situated the students' smoke-room, and next to it the professors' dining-room. Adjoining the latter is the ladies' dining-room. The students' dining-room, kitchen, and larder are in the basement. From the first landing of the staircase leading to the hall, access is obtained to an arts' lecture-room, capable of accommodating about fifty students. The cost of the new buildings will be about 17,000*l.* The architects are Messrs. A. Waterhouse & Son.

Leeds Medical School.—The new building of the medical department of the Yorkshire College, known as the Leeds Medical School, was inaugurated by the Duke of York on Friday, the 5th inst. The *Leeds Mercury* states that the style adopted is Tudor Gothic; the library and museum occupy the southern wing. On the south-east side are situated the professors' and students' common rooms, the Dean's office, porter's office, &c. Below the latter, and on a level with the courtyard, are a dining-room, smoke-room for the students, together with kitchen and store accommodation. The pathological department, with the general lecture theatre for pathology, materia medica, &c., occupies the north-eastern portion of the ground floor, whilst the physiology and anatomy departments are located in the north and east wings. The varying levels of the site allow of the janitor's house being placed at the north-west corner above the level of the street, though nominally in the basement, and also contribute largely to the lighting of the library. The principal entrance to the building is surmounted by a battlemented tower, which forms a prominent feature of the elevation. The outer porch is entered through an archway, with traceried and carved spandrels, enriched with emblems of the Tudor rose and lily. The floor of the porch is formed of marble mosaic and the ceiling of panelled oak. Separating the porch from the entrance-hall is an oak screen with folding doors, and glazed with white Cathedral glass in leaded patterns. The plan of the hall is a hexagon, 25 ft. in diameter, with arcaded sides. Above the arches, the walls are faced with Mansfield stone, and are relieved by mullioned clearstory windows. Vaulting shafts of faïence are carried up the principal angles of the hall to support the ribs of the groined oak roof; carved bosses are placed at the intersection of the vaulting ribs. The exterior of the building is faced with local bricks, whilst Morley stone is used for the dressings. All the carved work, both in wood and stone, was executed by the late Mr. J. W. Appleyard, of Leeds. The general structural work and the drainage have been carried out by Messrs. W. Wilson & Sons, of Headingley, Leeds. The architect is Mr. William Henry Thorp, of the same city.

King's Hall, Holborn Restaurant.—We have already alluded to this room which is worth a more detailed notice than we were able to give in our last. This new portion, which fronts on to Newton-street, although it is in connexion with the High Holborn and Little Queen-street entrances, consists, in the basement of large boiler rooms, engine room and kitchen, stores, &c. On the ground floor, entered from Newton-street by means of four entrances, protected by an iron and glass roof, treated in a very original and pleasing manner, is a spacious crush-room, off which are the ladies' and gentlemen's lavatories, and a large and conveniently situated cloak-room, and beyond is a smoking room. A grand staircase of marble, placed laterally, leads to the reception room on the first floor, extending the whole width of the front and of somewhat the same proportion as an Elizabethan gallery. In the centre of the inner wall to this room is the principal entrance to the banquetting-hall, known as the King's Hall. This, of course, is the *raison d'être* of the whole scheme and is intended to be used for grand banquets, public meetings, receptions, or dances, and is capable of dining 600 people. The main portion consists of a large central parallelogram of about 80 ft. by 40 ft., whose sides are divided into six bays by massive piers of red Verona marble connected together with circular arches; outside this central space, on either side are aisles about 80 ft. wide in two stories. The central nave is lighted by a columned clearstory over the main arches and is roofed with a semi-circular vault extending the whole width and supported on girders connected by purlins dividing it into panels. The coloured treatment of this vault, executed in Jackson's fibrous plaster, with the interior generally, is in the Early Italian manner, the central octagonal coffers being painted with cupids on a dark blue ground. The crown of the vault has large glazed circles with gilded iron grilles. The return ends of the hall have recessed first-floor galleries, somewhat lower than the galleries to the aisles, the easternmost one accommodating an orchestra of about fifty performers, while the westernmost is for ladies, or principal guests at a public meeting, an innovation which is certainly a step in the right direction. Above these galleries are the semi-circular gable-ends of the hall, in which the clearstory of the side walls is carried round, a lunette filling the space above. The lighting of the hall is effected entirely by means of the clearstory, the gable-ends, and the circles in the crown of the vault.

The main arcading to the central portion is of polished red Verona marble, the architrave and cornice over being treated with solid gilding, as also the capitals. The wall-surface of the two-storied aisles is covered with stamped leather, the balustrading to the gallery-front being of bronze, the dies between every third pilaster being faced with an enamelled and coloured shield, representative of the counties of England. The lower aisle ceiling is divided into squares of decorated plaster, the upper being a semi-circular vault following the lines of the arcading, and intersected by the cross-arches. The detail throughout is in a style of Renaissance, which we have begun to associate with Mr. Colcutt's name. The lower side-aisles are raised two steps above the main floor level, and the fresh heated air is brought in through the risers of the steps, while steam coils are placed above the main cornice under the clearstory windows to prevent any down-draught of cold air. Besides the opening in the barrel ceiling, the clearstory windows will be opened for extra ventilation. The marble work, of various beautiful colours, has been well executed by Messrs. Burke, throughout the building, especially in some of the fireplaces. American walnut is used for doors and fittings generally, the flooring to the main hall being of oak in 3 in. widths, and laid on strips of india-rubber about ½ in. thick, for giving elasticity for dancing purposes. The construction is fireproof, the materials used being iron, coke breeze, and cement. The ceiling to the main hall is a very satisfactory piece of work, and has been painted by Messrs. Thrigley & Hunt. The second and third floors are to be used as masonic rooms, &c. This addition makes the Holborn Restaurant probably the largest and best fitted undertaking of its class in the world, and reflects credit not only on the public spirit of the proprietors, but also on the manner in which the designs of Mr. T. E. Colcutt have been carried out by the general contractors, Messrs. Holland & Hannen, and by the various sub-contractors who have been employed on the works.

SANITARY AND ENGINEERING NEWS.

Proposed Pier, Morecambe.—A public meeting was held at Morecambe on the 27th ult. with reference to the construction of a pier, when a number of Manchester financiers who were willing to take over the concession of the pier order, attended. Large sums of money were subscribed for the purpose. Mr. Littlewood, architect, explained the construction of the pier; he said it would be about 800 yds. in length and made of wood and iron, having a pavilion about 200 yds. from the promenade. The entrance would have an ornamental ticket office with gates and turnstiles. The pavilion would be approached by a covered way from the entrance on the western side, and would have seating capacity for about 1,200 people, or thereabouts. Internally it is to be lighted from side windows, and in addition there would be a large dome in the centre; at each corner turrets would be placed. The iron piles to support the structure would be screwed down to a suitable foundation, the iron columns being tied together both ways with lattice girders. A platform would be situated at the extreme end, on which would be erected a band kiosk and seating accommodation for about 400 people. Shops would be built on each side of the pavilion, and shelters placed along the deck at intervals.

Bracknell Drainage.—The Local Government Board has given its sanction to a loan of 11,500*l.* for the sewerage and sewage disposal of Bracknell. The sewage will be purified by irrigation on 22½ acres of land. There are to be two small pumping-stations worked by oil-engines. The engineer of the scheme is Mr. W. H. Radford, C.E., of Nottingham.

Proposed Sewerage Works, Llandudno.—A Local Government Board enquiry was held at Llandudno last week, by Mr. Thomas Codrington, C.E., respecting an application by the Improvement Commissioners for permission to borrow 14,593*l.* for works of sewerage and sewerage extension. It was explained that the proposed scheme was an extension of that laid down in 1875, and was in consequence of the rapid growth of the town, and not, as had been thought, owing to the system at present adopted being at fault. The Commissioners' engineer, Mr. E. Paley Stephenson, gave details showing that the new outfall would be alongside the existing one, but 14 ft. nearer the Great Orme's Head. There would be a pumping-station immediately at the west end of Abbey-road to raise the sewage from the existing tank sewer at all states of the tide in case of flooding. It was intended to extend the present surface-water scheme and to separate the surface water from the sewage. But, although under the new system the sewage and surface water would be kept separate wherever possible, it would not be advisable to redrain all the existing houses with reference to surface water. In his opinion, if that were done, the present tank sewer would not be adequate for the requirements of the town. The proposal engendered considerable opposition on the part of residents and property-owners in the neighbourhood of the suggested works, and others. On their behalf it was submitted that a pumping-station was not necessary, it would be costly, and that it would be a great nuisance. The present system, it was stated, could be enlarged by duplicating the present outfall, and making the system separate throughout. The expense would be moderate, and the result entirely satisfactory. It would be prudent economy to spend 2,000*l.* in making the present system separate. The Town Commissioners replied that the scheme brought out under their auspices was believed to be the most practicable, and was so designed as to be the least nuisance to the majority of the inhabitants. The spot where the works were proposed to be carried out was a sparsely populated district. No witness for the opposition was a professional engineer. The inquiry then closed.

Electric Lighting, Worcester.—On Thursday last, the 11th inst., the new electric lighting works at Worcester were announced to be opened. They have cost between 45,000*l.* and 50,000*l.* The main features of the scheme are as follow:—The Corporation purchased an old mill at Powick, and, taking advantage of a 12-ft. fall in the river, erected a generating station. The water-power is developed by four inward-flow turbines of the Victor pattern, two 54-in., one 48-in., and one 30-in., the turbine-power being about 500 h.-p. There is sufficient steam-plant to generate the whole of the electricity on the rare occasions when, through flood, or drought, there might be too much or too little water for the turbines to be used. Each of the four turbines is fitted with an automatic regulator, which, having been fixed at the required speed, causes the machinery to regulate its own speed by increasing or decreasing the water-flow. The steam plant can be used either in conjunction with or instead of the water-power. There are three vertical compound marine engines of 290 i.h.-p. each. The turbines and engines are connected by cotton driving-ropes with four Mordey-Victoria alternators, each having a capacity of 125,000 watts, and absorbing about 200 h.-p. The engine-room is also fitted with a travelling-crane, capable of lifting up to twelve tons. In the boiler-house are four Babcock and Wilcock water-tube boilers, equal to 900 h.-p., fed from the river by two duplex feed-pumps. The generating station, in which there is plenty of room for future extension of the plant, comprises also stores, offices, and engineer's quarters. The current is taken to Worcester by two pairs of copper mains at a pressure of 2,000 volts. These are tapped at St. John's, and a low-tension main supplies the current for house lighting in St. John's. The high-tension mains then continue to the central transformer station at All Hallows, whence go two circuits for street-lighting, which is at present confined to High-street, Broad-street, the Cross, St. Swithin-street, and Foregate-street. There are various sub-transformer stations throughout the area to be supplied. The Guildhall, Public Hall, and other public buildings and offices have been fitted up for lighting by electricity, and there has already been a considerable demand for private lighting. Mr. Preece has advised the Corporation throughout; the Brush Electrical Engineering Company, Limited, were the contractors for the machinery and electrical plant, and Messrs. Rowbottom for building the generating station.

Water Supply Difficulties at Ledbury.—The inhabitants of Ledbury, in Herefordshire, are very difficult to please in regard to their water supply. It appears that their present supply has been condemned by reason of its extreme hardness, and the Local Government Board has recently written to the Parochial Committee asking them what they are doing in the matter. But the Committee evidently are not masters of the situation. Their proposals have been overridden by a large body of ratepayers, who have just passed the following resolution:—"That the inhabitants of Ledbury, in public meeting assembled, taking into consideration the delay which has taken place on the part of the Parochial Committee in dealing with the question of the public water supply, most emphatically protests against any further expenditure of public money for this purpose by the Parochial Committee, and is of opinion that the whole question should be deferred and dealt with by the Urban Council about to be elected by the ratepayers within the district for which the water is required." The Local Sanitary Authority met the next day and meekly bowed to the exigencies of circumstances, so that the work will now have to be done by the Urban District Council when it is elected—a very convenient way of shelving the question for the time being.

STAINED GLASS AND DECORATION.

Window, Emmanuel Church, Mannamead, Devon.—A stained glass window has recently been placed in the north transept of this church. The figures selected for representation are "Hope" and "Patience." It is from the studio of Messrs. Fouracre & Son.

Window, Torrington Church, Devon.—A stained glass window has just been inserted in the parish church of St. Michael, Torrington. It has four lights, and illustrates "The Return from Calvary." In the tracery are angels bearing symbols of our Lord's Passion. The work was executed by Messrs. Joseph Bell & Sons, of College-green, Bristol.

FOREIGN AND COLONIAL.

France.—M. Robert David d'Angers, son of the celebrated sculptor, has just presented to the Government a fine portrait of his father, painted by Hébert, formerly director of the French School at Rome. It has been placed in the council-room of the Ecole des Beaux-Arts.——M. Thomas, architect of the Palais des Archives, has had the figures on the façade (the "Four Seasons," "Prudence," and "Fame") restored, as also a bas-relief in carved wood representing "History" which adorns the tympanum over the principal entrance of the Archives building, opening on the Rue des Francs Bourgeois.——M. Willette, best known by his caricatures and illustrations to periodicals, is at work on a ceiling decoration for the "Cigale" Concert Hall, symbolising "La Chanson Française."——The Government has commissioned from M. Weerts a decorative panel 18 mètres long, intended for the "Cour d'Honneur" of the Sorbonne.——M. Dagnan-Bouveret has been commissioned to decorate a portion of the amphitheatre of the Faculté des Arts.——M. Louis Cordonnier, the architect, has been commissioned to direct the works for the building of the Hôtel de Ville at Dunkerque, at an estimated cost of 1,500,000 francs.——At l'Isle Adam, last Sunday, the monument to Dupré, the landscape painter, was inaugurated. The monument, carried out after the designs of M. Scellier de Gisors, architect to the Luxembourg, and son of the celebrated painter, is in the form of a semi-circle, in the midst of which is an erection with a triangular gable, beneath which is the bust of Dupré, by M. Marqueste, carved on a stele. The basement is ornamented with a lion's head spouting water into a vase.——Two international railway lines between France and Spain are to be established across the Pyrenées. The first will start from Saint Girons, terminating at Lerida; the second will run from Oloron (Basses Pyrenées) to join the line of Saragossa and Barcelona. There will be a tunnel on each line of seven or eight kilomètres in length. The works are to be finished in ten years.——In the competition for a military commemorative monument at Remiremont the design of M. Adrien Gaudez has been selected for execution.——The Academie des Beaux-Arts has awarded the Jean Leclaire prize to MM. Jaussely and Bernard, the pupils of the school who have done best during the year.——M. Alfred Delauney, an etcher of talent, is dead at the age of sixty-five. He had executed numerous plates of Old Paris, as well as a remarkable work of the principal cathedrals of France.——The death is also announced of M. Jacques Léon du Sautoz, painter, a former pupil of Drolling, and recently director of the school of drawing at Fontainebleau.

Germany.—The Emperor has granted 2,000*l.* towards the restoration of the historical church of St. Kilian, at Corbach.——The architect Christoph Hehl, of Hanover, has been appointed to the chair of Mediæval architecture at the Berlin Technical College in the place of Professor Schaefer, who has accepted a similar post at Carlsruhe. Herr Hehl is a native of Cassel, and worked for some time with Messrs. Street & Scott, in London. This year's Art Exhibition contains his plans for the Garrison Church at Dresden in Basilica style, and for a town hall in the style of the Renaissance.——The autumn lectures at the Arts and Crafts Museum will include a course on "The Ceramic Art in its Relation to Architecture," by Herr Richard Borrmann.——According to the presidential address at the recent meeting of the Railway Society the total length of the German normal-gauge lines has increased from 33,708 k. in 1881 to 42,964 k. at the end of last year, of which 38,944 k. are owned by the State.——The municipality of Berlin has taken over the water-supply of Treptow, and 3,000*l.* is to be spent on the necessary conduits.——The Congress of Historical Art ("Kunstgeschichte") held its opening meeting last week at Cologne, under the presidency of Professor Carl von Lutzow of that city. The chief item on the programme is the inspection of the numerous art treasures in the museums and churches of the city, as well as those in the hands of well-known private collectors. To commemorate the Congress, the municipality has presented every member with Dr. Eunen's privately-printed work on the Cologne Cathedral.——The town of Halle has applied for permission to restore about a half of the Moritzburg, and has voted 10,000*l.* to this object. Should the permission be granted, the restored part is to receive the Municipal and Provincial Museums.——Traces of a Roman settlement have been discovered near Rothselburg, in the Palatinate, and excavations on a larger scale are to be undertaken next year. The finds include some well-preserved statuary, which has been placed in the museum at Speyer.——Lieutenant Dahm, of the *Limes* Commission, who is engaged on investigations in the district around Ems, has discovered traces of Roman fortifications along the right bank of the Emsbach valley, near Arzvach, and excavations are being actively prosecuted.

Austria.—The Emperor was present at the recent laying of the foundation-stone of a new church in the Ottaring, at Vienna. Cardinal Gruscha officiated.——The Vienna Arts and Crafts Museum has secured a collection of photographs of the furniture specially constructed for the "Achilleion," the Empress of Austria's palace at

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Chapel	St. Peter's Port Hospital, Guernsey	.....	Oct. 25
*School for 1,000 Children	Weston-Super-Mare School Board	.....	Nov. 21
*Public Buildings	Sutton (Surrey) Lc. Bd.	50*l.* & 20*l.*	Nov. 27
*Museum for Antiquities, Cairo	Egyptian Government	First 600*l.* and 400*l.* between the next four	Mar. 1, '95

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Wood Paving, Union-street	East Stonehouse L. B.	W. Stringfellow	Oct. 16
Infirmary, Baltimore, Cork	Committee of the Davis Memorial	W. H. Hill	do.
Road Materials	Luton Town Council	*Official*	do.
Additions to Schools, Witton Gilbert, Durham	Rev. A. Watts	do.	do.
Three Cottages, Yarm, Yorks	N. E. Ry. Co.	Wm. Bell	Oct. 17
House and Two Cottages, Carlton, near Stockton	do.	do.	do.
Additions, &c. to Shops and Offices, St. Andrews	Guardians of Norwich Incorporation	J. B. Pearce	do.
Street Works	Birkenhead Corp.	C. Brownridge	do.
Cottages, Johnstown, Ruabon	Chas. Bellis	.....	do.
Five Houses, Hoddlesden, Lancs.	Local Co-op. Soc.	J. B. Thornley	do.
House, Wraysbury, near Staines	.....	Sargeant & Son	do.
Sewers, &c.	Thornton (Yorks) L. B.	John Drake	Oct. 18
Pair Semi-detached Houses, Cavendish-road, Barnsley	.....	Robt. Dixon	do.
Water Supply Works, Boscastle, Cornwall	Camelford R.S.A.	R. H. Worth	do.
Chapel, next Hospital, St. Peter Port, Guernsey	Poor Law Board	*Official*	do.
*Reading Room, Hasland; Waiting Room, Duffield	M. R. Co.	do.	do.
Schools, Treharris	Merthyr Tydfil School Board	Jno. Williams	Oct. 19
Schools, Greenbank, near Bristol	St. George's Sch. Bd	F. Bligh Pond	Oct. 20
Roadmaking, Cemetery	Droylsden (Lancs.) Local Board	*Official*	do.
Residence, Rosetta National School, Belfast	.....	Jas. J. Phillips	Oct. 22
Cast-iron Pipes, &c.	Southport Corp.	W. Crabtree	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Four Houses, Beechcliffe, Keighley	Bethel Rhodes	.....	Oct. 22
Reservoir, &c.	Belfast Water Com.	L. L. Macassey	Oct. 23
Schools, near Burnley	Barrowfield Sch. Bd.	Thos. Bell	do.
*Stoneware Pipe Sewer	Lewisham Bd. of Wks.	*Official*	do.
Infirmary Buildings, Pleck-road	Walsall Union Gdns.	H. E. Lavender	Oct. 25
*Erection of Unclimbable Iron Fencing	Walthamstow Lc. Bd.	G. W. Holmes	Oct. 26
*Making-up and Paving Roads, Schools	do.	do.	do.
Well Sinking, &c. Selston, Notts.	South Normanton (Derbysh.) Sch. Bd.	J. T. Shardlow	Oct. 29
*Schools at Red-lane	Basford Union	Geo. Hodson	do.
Parish Church, New Ross, Wexford	Coventry Sch. Bd.	G. & I. Steane	Oct. 30
*Pipe Sewer	Rev. Canon Kavanagh	W. G. Doolin	do.
*Larder and Scullery at Workhouse	Wandsworth Bd. of W.	*Official*	do.
Church, Charminster, near Dorchester	Poplar Union	Messrs. Clarkson	Oct. 31
*Church on Asylum Estate, Charminster	Asylum Visiting Com.	G. T. Hine	do.
*Refuse Destructor	Dorset Lunatic Asylum Committee	do.	do.
*Library and Reading Rooms	City of Sheffield	C. F. Wike	do.
Hospital, Crumlin-road, Belfast	Christ's Hospital, Abingdon	J. G. T. West	Nov. 3
*Erection of Buildings for Hospital	Bishop of Down and Connor	W. J. Fennell	Nov. 5
*Additional Wards in Asylum	Boro' of Croydon	*Official*	Nov. 6
Business Premises, Ryhope, Durham	Staffordshire County Lunatic Asylum	Mr. Stanger	Nov. 12
Vicarage, Chesterfield	Walter Wilson	Stephen Piper	No date
Schools, Cumwhitton, Carlisle	.....	Evans & Jolly	do.
Horticultural Building, Barnet	Wetheral Sch. Bd.	Johnstone Bros.	do.
Gordon Hotel, Boscombe, Bournemouth	.....	Maxwell Williams	do.
*Cottages at Catford	.....	Dancaster & Taylor	do.
	.....	E. Tompkins	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Assistant Borough Surveyor	Walsall Corporation	160*l.*	Oct. 15
*Surveyor	Rugby U.S.A.	250*l.*	Oct. 17
Clerk of Works	Rochdale Corp.	Not to exceed 2*l.* 12*s.* 6*d.* per week	do.
*Clerk of Works	Met. Asylums Board	4*l.* 4*s.*	Oct. 18
*Assistant Surveyor	Fulham Vestry	175*l.*	Oct. 22

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii. *and* xx. *Public Appointments, pp.* xviii.

Corfu, by Professor Caponetti, of Naples. It is extremely interesting, as embodying modern requirements with exclusively ancient Greek models.

ITALY.—A new Government Palace, built from designs by Signor Azzuri, has been inaugurated at San Marino. The Italian poet Carducci pronounced an address on the occasion.

NETHERLANDS.—The city of Amsterdam has decided to hold an International Exhibition of Means of Transport and Hotel Arrangements next summer. The site will be that occupied by the Universal Exhibition of 1883, at the back of the State Museum.

MISCELLANEOUS.

INSTITUTION OF CIVIL ENGINEERS.—We are asked to state that while the premises of the Institution of Civil Engineers are being rebuilt, such arrangements have been made as will admit of the use of the lecture-theatre and reception-rooms under it during the session 1894-95, although the library and offices have been temporarily removed to 9, Great George-street.

NOTICE OF REMOVAL.—Mr. F. H. A. Hardcastle has removed from his former address in Southampton-street, Strand, to 5, Old Queen-street, Westminster.

BUILDING TRADE OF BAVARIA.—According to a recent report of the Second Secretary to the British Legation at Munich upon the industries and commerce of Bavaria, the greatly-depressed condition of trade in Bavaria continues. The building and allied trades, including the glazing and tile industries, were somewhat less depressed last year; but the ceramic and porcelain industries, especially cement and pottery, steadily declined. There was a slight improvement in the marble industry. A slight increase in the building trade of Munich was noticeable, 1,586 buildings having been erected, as against 1,524 in 1892. There was a large number of offers from the smaller brickmakers and quarry-owners, which tended to lower prices. Raw materials and wages remained stationary. The brick industry was in much the same state as in 1892. The production of building-stone from the quarries of Pfalz has depressed. The competition of Belgium has reduced the output from the quarries in the Rhine districts; and Berlin is supplied by Sweden. Munich imports the greater part of her requirements from Bohemia. Grooved tiles were in fair demand, but their sale abroad had almost ceased. The import duty of 16*s.* 4*d.* to 1*l.* imposed by France on grooved tiles has tended to attract those articles to the German markets. The parquet factories in Oberbayern report an improvement in their business. Wages during the building season were high, as much as from 7*s.* to 10*s.* per day being paid for good workmanship. Window-panes were in poor demand, and the export of glass windows, &c., is no longer possible, for railway freights in Germany are high, and the prices paid for window-glasses, &c., in the different markets of the world are low.

ANGLO-SAXON CEMETERY AT WORTHING.—The *Daily News* says that further excavations recently made on the site of the Anglo-Saxon Cemetery on the top of High Down Hill, near Worthing, have yielded some interesting results. The ground has been trenched under the direction of Mr. C. H. Reed, of the British Museum, who regards it as the largest and most important Saxon cemetery yet found in Sussex. Many interments have been traced. The most notable discovery has been that of a collection of glass vessels, which vie with those of the same period now preserved in the British Museum. One of these is described as shaped like a tall wine-glass without a stem, and ornamented with loops of thick white glass. Another is a vase of slender shape, with raised figures and some Greek characters upon it. In one grave some fifty or sixty small beads were found. In another, in which part of a child's skull was uncovered, were found several glass beads and some thin decorated discs of bronze.

CARLISLE A CELTIC SETTLEMENT.—An interesting archæological discovery has been made in connexion with the ancient history of Carlisle. Professor Boyd Dawkins, of Owens College, Manchester, recently paid a visit to the museum which has been established at Tullie House, Carlisle, and examined the extensive collection of Roman remains, some of which turned out to be Celtic, and as they had been dug up in various parts of the city, they furnish conclusive evidence that Carlisle was a Celtic settlement prior to the time of the Roman occupation. One of the specimens, which had been broken when dug up, enabled Professor Dawkins to discover the process by which the Celts did their enamelling—namely, by fusion, and not inlaying; this fact was not previously known.—*Leeds Mercury.*

THE WHEEL AT EARL'S COURT.—The gigantic wheel at the Earl's Court Exhibition, which was the object of a visit by the Junior Engineering Society last Saturday, is in process of construction as an attraction to that establishment. The diameter of the wheel is 300 ft. The horizontal axle, which is now in position, at a height of about 150 ft., is 40 ft. long, and weighs 53 tons, the plummer-blocks 11 tons each. Eight inclined iron columns, each with a concrete foundation of 25 cubic ft., support the axle. The erection of the wheel-spokes and rim will be dealt with in four sections, each weighing 150 tons, and consisting of ten sub-sections. The first quadrant is being built from the ground; the other three will be built from staging 110 ft. high, and twelve cranes working simultaneously will be employed in connexion. There will be forty carriages suspended from the wheel, each capable of carrying forty passengers. The wheel will be rotated by means of two fifty h.-p. Robey steam-engines. The start and finish of the journey of one revolution will be made a little above ground level, from two loading platforms, each 150 ft. long. Eight carriages at a time will be emptied and loaded; in this process the wheel will thus make one-fifth revolution between each set of carriages; after a complete revolution has then been made, the carriages will be emptied and loaded again in the same way. It is estimated that the whole journey, including starting and stopping, and the uninterrupted complete revolution (occupying about eight minutes) will be performed in about twenty minutes. Each carriage will be lighted by electricity, and there will be a double line of electric lamps all round the rim of the wheel. A separate engine is provided for driving the dynamos. The steel girder work is by the Arrol Bridge and Roof Company; the carriages by Messrs. Brown, Marshall, & Co.; the axle and bearings by Messrs. Maudsley, Sons, & Field; and the electrical work by Messrs. Statter. The engineer is Mr. Walter B. Bassett, while Mr. C. F. Hitchins is resident engineer. We have as little sympathy with this foolish kind of sensational toy as we have with Eiffel towers, but no doubt the construction of such a wheel so as to provide for all the enormous and varying strains brought upon the structure in the course of revolution is practically a very interesting engineering problem. It is only a pity that all the ability and cost expended in its construction should not be devoted to some more useful end than carrying coach-loads of fools round a vertical circle.

IMPROVED EAR FOR RAIN-WATER PIPES.—Mr. Robson, whose shelter tiles for walls have received notice in our columns, sends us a specimen of an ear for fixing rain-water pipes, in which the ear is bevelled off so as to admit of the nails being driven at an obtuse angle, and more easily reached without interfering with the pipe. The nails are driven through slots open at the end, so that those at one side can be driven before the pipe is in position, and serve to hold the pipe up while the others are being driven. Two slots, one above the other, are provided to render it easier to arrange for nailing into the joint of the brickwork.

GOLDSMITHS' COMPANY.—The "Technical and

Recreative Institute" in connexion with this company commenced its classes on the 1st of the month. Mr. Harold Busbridge has been appointed principal lecturer in building construction, carpentry and joinery, and brickwork and masonry. Special classes for elementary, advanced, and honours building construction will be held during the current session; and practical workshop instruction in brick-cutting by Mr. W. J. Goodwin, carpentry by Mr. G. Allworth, and plumbing by Messrs. J. W. Hart and D. Early, R.P.C., will also be given. Artisans and apprentices are admitted to these classes at half the usual fees.

A FLUTED PUTTY-KNIFE.—A specimen of this knife has been sent to us, which is patented by Mr. Albert Blake, and made by Messrs. Tyzack & Son, Sheffield. The knife ends in a corrugated section, the object of which is to finish off the putty in a reeded form. It would make a neat finish, if glaziers find it practically convenient for use.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The eighteenth voluntary pass examination of candidates for the offices of Municipal Engineers and Surveyors to Local Boards, carried out by this Association, was held at the Council-house, Birmingham, on Friday and Saturday, the 5th and 6th inst. Eighteen candidates presented themselves for examination, the written portion of which was taken on the first day. The greater portion of the second day was occupied with *vivâ voce* questions. The examiners were:—I. For Engineering as applied to Municipal work: Edward Pritchard, M.Inst.C.E., of Birmingham and London (Past President). II. Building Construction: W. George Laws, M.Inst.C.E., City Engineer, Newcastle-on-Tyne (Past President). III. Sanitary Science: Alfred M. Fowler, M.Inst.C.E., of Manchester (President). Public Health Law: Joseph Lobley, M.Inst.C.E., Borough Engineer, Hanley (Past President).—The next examination will be held in London, in April, 1895.

MEETINGS.

FRIDAY, OCTOBER 12.

Architectural Association.—Opening Conversazione, Queen's Hall. 8 p.m.

SATURDAY, OCTOBER 13.

London and Provincial Builders' Foremen's Association.—Quarterly Meeting, Memorial Hall, Farringdon-road. 7.30 p.m.

MONDAY, OCTOBER 15.

A.A. Camera Club.—Presidential Address and "Holiday Notes," by Members. (No place or hour furnished.)

TUESDAY, OCTOBER 16.

Glasgow Architectural Association.—"The Abbeys and Cathedrals of Scotland," by Mr. P. McGregor Chalmers. 8 p.m.

"Norman Architecture." Lecture by Mr. Arnold Mitchell, Chelsea Town Hall. 3 p.m.

WEDNESDAY, OCTOBER 17.

Foremen and Clerks of Works' Association.—Quarterly meeting. 8 p.m.

Sanitary Institute (Lectures to Sanitary Officers). "Elementary Physics," by John Castell-Evans. 8 p.m.

Carpenters' Hall (Lectures to Students on Sanitation). "Building Acts and By-laws for controlling the construction of Buildings," by P. Gordon-Smith. 8 p.m.

FRIDAY, OCTOBER 19.

Sanitary Institute.—Second lecture on "Elementary Physics," by John Castell-Evans. 8 p.m.

SATURDAY, OCTOBER 20.

Sanitary Institute (Lectures to Sanitary Officers). "Practical demonstration of Examples of Building Construction under By-laws," &c., by Dr. Darra Mair. 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

18,026.—WINDOW FRAMES AND SASHES; *J. Clayton*,—Blocks and strips which turn upon the hinge or joint, enabling the sash to be turned inwards are the main features of this invention.

19,939.—COMPOSITE BUILDING SLABS: *A. Mack.*—To strengthen these, layers of woven fabric, or loose stalks of vegetable fibre, are embedded in the mass. Special mixtures of plaster, gypsum, &c., are also used in preparing these boards or slabs.

20,300.—LADDERS: *J. Batchelar.*—In order to unite two ladders at their upper parts so that they may be opened to give an extended base, the ladders being separable, a fastening is made with ears and a bolt passing through, which, acting as a hinge, allows the ladder to be used as a pair of steps or a double ladder.

20,346.—LIGHTHOUSES, &C.: *G. T. M. Blanchard.*—To provide a foundation for lighthouses and deep water structures of light construction, two walls are arranged parallel to each other so as to form a double wall to enclose the space to be built upon. These are of stone, concrete, or metal, and metal beams and girders are arranged between the walls so that the outward pressure of the water is taken by both walls.

7,208.—SINKS: *A. Jones.*—These sinks are constructed so that they form also a bath, or washing-tub, suitable for working men's cottages, &c. Near the top of the bath inside is a flange, turning upward, finished with a curl or bend. On the upper part of this flange rests the bottom of the sink of timber. The sink bottom allows sufficient space for the water to run into the spout formed by the flange and is discharged through a suitable hole in the side of the bath. If used as a bath the sink bottom is simply lifted out.

14,541.—CLOSETS: *W. Krebs.*—Relates to a hydraulic seat for closets, automatically operated by the opening and closing of the lid whether the closet is flushed with water or not. A flanged dish with a water-pocket is brought up by the action of closing the seat, and released when the lid is lifted.

14,599.—PRESERVING WOOD: *E. Groebe.*—The wood is impregnated with a solution of phosphate of lime in sulphurous acid and then dried either in kilns or in the open air.

NEW APPLICATIONS FOR LETTERS PATENT.

SEPTEMBER 24.—18,093, T. Robinson, Circular Saw Benches.—18,105, C. Reid, Safety Window.—18,117, F. Gavon, sen., Jointing Lead or Soft Metal Pipes and other Plumber's Connexions.—18,126, J. Hall, Jointing Stoneware and other Pipes, &c.

SEPTEMBER 25.—18,178, A. Fairer, Fastener for Windows.—18,179, W. Appleford, Syphon Flushing Cisterns.—18,210, G. Cory, Composition for Roads, Pavements, and Floors.—18,220, R. Ray, Ventilating Brick.

SEPTEMBER 26.—18,227, R. Beale, Hinged Joint.—18,229, J. Peake, Making Hip, Ridge, or Valley Roofing Tiles.—18,251, W. Ingham and B. Langton, Machines for Making Sanitary Pipes.—18,270, J. L. Thomasson, Paint Brushes.

SEPTEMBER 27.—18,299, F. Park, Disinfecting Ventilators.—18,334, J. Wharfe, Window Lock.—18,338, J. Cooper, Soldering-irons.

SEPTEMBER 28.—18,364, G. Waller, Hinge for Doors or Covers of Cess-pits, Drains, &c.—18,380, W. Walks, Wind and Rain Excluder.—18,384, W. Thomas, Ventilating.—18,394, C. Williams and J. Slotter, Disinfecting Cisterns, Pans, &c., for Water-closets.—18,404, T. Schröder, Chimney Cowls.

SEPTEMBER 29.—18,471, D. Mitchell, Syphon-action for Flushing Water-closets.—18,476, T. Black, Opening Window-sashes Inwards.—18,478, W. Youlton, Casements.—18,486, O. Steed, Door-bolts, or Fastenings.—18,490, H. Granel, Construction of Underground Railways.—18,500, G. Thornborough and J. Wilks, Movable Partitions.—18,508, A. Boult, Band-saws for Cutting Blocks of Marble, or other Stone.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14,510.—D. Griffin, Combination Hinge Lock and Sash Fastener.—14,710, J. Day, Waste Water-closets.—16,021, C. Buchanan and J. Barr, Pivot-Sash and Case Window.—16,051, G. Bullock, Disinfecting Ventilator for Public Buildings, &c.—16,109, E. Sheldrick, Window Sash.—16,704, J. Harris, Sash Fasteners.—16,924, H. Burnet, Drain and Soil-pipe Testing Apparatus.—17,403, B. Cochrane, Bricks.—17,621, W. Smith, Bricks, or Building Blocks.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

19,348, R. Roman, Soldering-irons.—20,080, P. O'Connor, Heating and Ventilating Buildings or Structures.—20,239, J. Noad and S. de Ferranti, White Lead.—21,872, F. Maclean and R. Kay, Hingeing Sliding-Sash Windows to open inwards.—22,507, J. Stables, Window Bolt Fastener.—7,847, I. Inge, Sash Fasteners for Sliding Sashes, and Windows and Shutters.—12,719, J. Anderson, Automatic Dovetailing Machines.—15,845, W. White, Swinging Gates.—16,245, G. Vogt, Chimney-top Mounting.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

SEPTEMBER 26.—By *Simmons & Sons* (at Henley-on-Thames): Outlying portions of the "Stonor Estate," near the "Red Lion" Inn, Peppard Common, f., r. 12*l.*, 400*l.*; f. residence, farmery and 3 a. 2 r. 29 p., r. 22*l.*, 500*l.*; "Bricklayers' Arms," beer-house, f., r. 30*l.*, 490*l.*; "Rising Sun" Inn and 1 a. 1 r. 32 p., f., r. 12*l.*, 460*l.*; the "Green Man" Inn and 1 a. 0 r. 34 p., f., r. 22*l.*, 670*l.*; the "Bull Hotel" and 6 a. 3 r. 31 p., f., r. 50*l.*, 1,400*l.*; two f. houses and shops, Nettlebed, r. 32*l.*, 590*l.*; f. residence, cottages and 0 a. 3 r. 16 p., r. 37*l.* 10s., 550*l.*; numerous cottages and land, 36 a. 1 r. 29 p., 6,569*l.*; numerous cottages, gardens, and fruit land, 16 a. 0 r. 1 p., 2,497*l.*; enclosures of building land, 22 a. 2 r. 32 p., 860*l.*

OCTOBER 2.—By *J. Bott*: 39, Spencer-rd., Herne Hill, u.t. 68 yrs., g.r. 4*l.*, r. 32*l.*, 285*l.*—By *Reynolds & Eason*: 78, Southborough-rd., Hackney, u.t. 59 yrs., g.r. 6*l.*, 345*l.*; 19, 21, Bradstock-rd., Hackney, u.t. 52 yrs., g.r. 9*l.*, 510*l.*; 55, 57, Cornwall-rd., Tottenham, u.t. 60 yrs., g.r. 9*l.*, 175*l.*

OCTOBER 3.—By *P. Hodson*: 2, 3, Pitts-pl., Parson's Green, f., r. 68*l.*, 1,000*l.*; 2, Beech-st., City of London, the lease of, u.t. 11 yrs., r. 80*l.*, 75*l.*

OCTOBER 4.—By *Protheroe & Morris*: Hillbrow Villas, Finchley, f.g r. of 65*l.*, reversion in 93 yrs., 1,620*l.*; 61, Cumberland Market, Regent's Park, u.t. 30 yrs., g.r. 8*l.* 8s., r. 36*l.*, 350*l.*; Percy-ter., Hackney, f.g.r. of 36*l.*, reversion in 30 yrs., 780*l.*; Major-rd., Stratford, f.g.r. of 4*l.*, ditto in 68 yrs., 130*l.*—By *Stimson & Sons*: 5, Spencer-rd., Herne Hill, u.t. 73 yrs., g.r. 6*l.*, r. 35*l.*, 290*l.*; 64, Kent House-rd., Sydenham, f., r. 36*l.*, 370*l.*—By *Newbon & Co.*: No. 35, Newington Green, f., "Upland Cottage," 1,510*l.*; 75, Highbury Hill, Highbury, u.t. 68 yrs., g.r. 12*l.* 10s., r. 70*l.*, 475*l.*; 115, 117, Grove-rd., u.t. 69 yrs., g.r. 16*l.*, r. 110*l.*, 1,025*l.*; 28, Trinity-st., Islington, u.t. 12 yrs., no g.r., r. 36*l.*, 100*l.*; 2, High-st., Kingsland, u.t. 74 yrs., g.r. 150*l.*, r. 250*l.*, 970*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursday.*]

ABINGDON.—For the erection of twenty-four artisans' dwellings, for the Master and Governors of Christ's Hospital. Mr. Jno. Geo. T. West, architect. Quantities by the architect:—

Bartlett Bros.	£5,700 0	Polley	£4,705 10
Bell & Son	5,692 0	Martin	4,678 0
Bottrill & Son	5,597 0	Wenham	4,660 0
Silver & Son	5,497 0	Hunt	4,593 0
Goodchild	5,425 0	Colborne	4,500 0
Parnell & Son	5,113 0	Grant	4,297 0
Simonds	5,000 0	Wheeler	4,247 0
Macandrews	4,940 0	Buckle	4,100 0
Thatcher	4,753 0	Robinson	3,875 0
Wiltshire	4,719 0		

AYR (N.B.).—Accepted for the construction of quay wall, &c., for the Harbour Trustees. Mr. H. W. Eaglesham, C.E., 54, Fort-street, Ayr:—

Hugh Kennedy & Sons, Partick £21,022

BELFAST.—For alterations, &c., to Presbyterian church, Loughaghry, for the committee. Mr. Wm. Batt, architect, Garfield-chambers, Belfast. Quantities by Mr. S. C. Hunter, Belfast:—

James Kidd	£1,586	James Vernon & Son	£1,150
W. J. Campbell & Son	1,580	A. Marshall	1,123
M. Hearst	1,290		

BRIDLINGTON QUAY.—For the erection of laundry buildings, &c., at St. Anne's Home. Mr. W. H. Lancashire, architect, 11, East Parade, Sheffield:—

Anthony Lyons	£1,205 17	John Keswick, York*	£1,153 0
John Rennard	1,197 0		

* Accepted.

BRIGHTON.—For the erection of refuse destructor buildings and chimney-shaft, Corporation Yard, for the Town Council. Mr. Francis J. C. May, C.E., Town Hall, Brighton:—

J. Yates & Co.	£11,763	W. A. Field & Co.	£8,517
Davis & Co.	10,535	B. Cooke & Co.	8,380
Parsons & Son	9,527	J. Longley & Co., Crawley, Sussex*	8,169
Manlove, Alliott & Co.	8,670		
W. Cunliffe	8,595		

* Accepted.

BURNLEY.—Accepted for the conversion of "Newtown" mill into the "Empire" Music Hall. Mr. G. B. Rawcliffe, architect, 5, Nicholas-street, Burnley. Quantities by the architect:—

Masonry.—Benj. Smith, Cavour-street, Burnley	£500
Joinery.—Clegg Bros., Blakey-street, Burnley	500
Iron Galleries.—Wm. Walton, St. James'-street, Burnley	215
Iron Emergency Stairs.—Pollard Bros., Atlas Foundry, Burnley	150
Plastering.—O. Lister, Ilkley, Yorkshire	130
Concreting.—O. Lister, Ilkley, Yorkshire	150
Heating.—Elliott & Co., Market-street, Manchester	91
Lighting.—J. Stott & Co., Market-street, Manchester	180
Sprinklers.—Dowson, Taylor, & Co., Blackfriars, Manchester	110
Plumbing.—Watterson & Co., Bridge-street, Burnley	48

BURTON-ON-TRENT.—For extensions to school buildings, Stanton, for the Stanton and Newhall School Board. Mr. Henry Beck, architect, 30, High-street, Burton-on-Trent:—

J. Leedham	£990	G. Kennard	£888
T. Lowe & Sons	980	R. Kershaw	875
W. E. Shaw	974	Slater & Harrison, Overseal*	826
E. Clarke	973		
T. West	906		

*Accepted.

BURTONWOOD (Lancs.).—Accepted for the construction of sewers, settling-tanks, fencing, &c., for the Warrington Union Rural Sanitary Authority. Mr. Wm. Owen, Surveyor, Cairo-street-chambers, Warrington:—

Beckett & Co., Hartford, Cheshire £1,184

CAMBORNE (Cornwall).—For additions to the Mining School buildings. Mr. Silvanus Trevail, architect, Truro:—

A. Carkeet	£1,650	W. H. Stephens, Penzance*	£1,380
Shipman & Carveth	1,436		

* Accepted.

CARDIFF.—For the construction of 170 yds. stone boundary wall at the cemetery, for the Burial Board. Mr. W. Harpur, C.E., Borough Engineer, Town Hall, Cardiff:—

Lattey & Co.	£779 5 0	E. Turner & Son	£475 1 0
M. Gibbon	590 15 0	W. G. Morris	465 4 0
G. Griffiths	563 18 0	T. Harris	454 17 0
P. H. Venning	534 15 0	H. Gibbon	451 10 0
E. H. Page	490 8 0	W. Best & Co.	414 0 0
R. Cox & Bardo	480 0 0	F. Ashley	410 7 4
Barnes, Chaplin & Co.	475 10 0	E. R. Evans*	370 15 8

* Accepted.
[All of Cardiff.]

CARDIFF.—For the erection of Baptist chapel, Splott-road. Messrs. Habershon & Fawckner, architects, Pearl-street, Cardiff:—

D. C. Jones & Co.	£4,953 0	T. Morris	£4,378 0
Stephens, Bastow, & Co.	4,749 0	Lattey & Co.	4,378 0
James Allan	4,643 0	Hatherly & Carr	4,295 0
Knox & Wells	4,600 0	H. Davies	4,251 12
C. C. Dunn	4,575 0	F. G. Robins	4,112 0
W. Best & Co.	4,411 15	Tagfio	4,100 0
Turner & Sons	4,400 0	T. Wood & Son	3,997 0

CARDIFF.—For additions to Broadway Schools, Roath. Messrs. Habershon & Fawckner, architects, Pearl-street, Cardiff:—

Gough Bros.	£870	H. Davies	£795
A. G. Howell & Co.	840	G. Hallett	780
F. G. Robbins	830	Beer & Sons	752
W. R. Copp	824		

[All of Cardiff.]

CARDIFF.—For the erection of Mission Hall, Grangetown. Messrs. Habershon & Fawckner, architects, Pearl-street, Cardiff:—

D. J. Davies	£3,220 0 0	E. R. Evans	£2,834 0 0
J. H. Firbank	2,955 10 0	T. Wood & Sons	2,830 0 0
C. C. Dunn	2,950 0 0	Shepton & Son	2,785 0 0
G. Griffiths	2,950 0 0	D. Davies	2,778 0 0
Best & Co.	2,905 14 0	H. Gibbon	2,700 0 0
Lattey & Co.	2,865 0 0	G. Rutter	2,647 0 0
Hatherly & Carr	2,853 15 7	Turner & Sons	2,638 0 0
E. Trotman	2,837 0 0	H. Davies	2,579 0 0
A. J. Howell & Co.	2,836 2 9	Knox & Wells	2,368 0 0

CORSHAM (Wilts.).—For the erection of school buildings, for the School Board. Mr. Harold Brakspear, architect, Corsham. Quantities by Messrs. Pinks & Watson, 45, Parliament-street, S.W.:—

J. Hyde	£3,915 11	W. Beazley	£3,410 0
D. C. Jones & Co.	3,789 0	W. H. Francis	3,150 0
Light & Smith	3,617 0	Downing & Rudman, Chippenham*	3,057 0
J. H. Wilkins	3,444 0		

* Accepted subject to approval of the Education Department.

COVENTRY.—For the erection of Primitive Methodist chapel and schools, Ford-street. Mr. John Willis, architect, Victoria-chambers, Derby:—

Thos. Wright	£2,197 4 6	Liggins & Strong	£1,869 4 3
A. A. Wincott	2,684 10 0	John Isaac & Son	1,757 14 6
C. Haywood, junr.	1,957 0 0	John Worwood, Much Park-street, Coventry*	1,739 8 0
Chas. Garlick	1,954 10 0		
Thos. G. Golby	1,882 3 6		

* Accepted.

CROYDON.—For the erection of six houses, Stretton-road. Mr. F. N. Kemp, architect, 22, Chancery-lane, W.C.:—

Olley, Norton & Co., 24, Queen Victoria-street (accepted) £2,310.

DORCHESTER.—For alterations and additions to the "Swan Inn," Fordington. Mr. A. L. T. Tilley, architect, 16, Cornhill, Dorchester:—

J. Guy & Son	£755 0 0	P. Barrett & Son, Dorchester*	£624 10 5
R. Davis & Son	749 11 11		
C. E. Slade	743 0 0		

*Accepted.

DOVER.—For the supply of 500 tons Guernsey granite, &c., for the Town Council:—

	Granite. Per ton. s. d.		Siftings. Per ton. s. d.
Nowell & Robson	11 11	....	9 9
R. L. & J. Fennings	11 9	....	9 9
William Griffiths	11 9	....	9 0
A. & J. Manuelle	11 6	....	8 6
Rowe & Mitchell	11 3	....	9 9
Fry Bros.	11 0	....	7 5
John Mowlem & Co., Westminster*	10 9	....	7 5

* Accepted.

GATESHEAD.—Accepted for paving, cementing, &c., Cowper-and other streets, for the Corporation. Mr. J. Bower, Borough Surveyor, Town Hall, Gateshead:—

Cowper-street.

Paving.—J. Wardlaw, Gateshead £334 11 4
Cementing.—T. Rule, jun., Gateshead 93 18 6½

Stanhope-street.

Paving.—J. J. & J. Robson, Newcastle £234 0 9

Back Worley-avenue.

Paving.—J. J. & J. Robson, Newcastle £377 19 3
Cementing.—W. Nevison, Gateshead 17 6 6

GREENWICH.—For making-up and paving Humber-road and Westcombe-hill (parts of), for the Board of Works. Mr. Heward, Road Surveyor, Board of Works' Offices, 141, Greenwich-road, S.E.:—

Westcombe-hill.

Fry Bros. £1,488
John Mowlem & Co., Westminster (accepted) 1,438

Humber-road.

Fry Bros. £369
John Mowlem & Co., Westminster (accepted) 259

HEREFORD.—Accepted for the erection of two houses, Westfields, for Mr W. Preece. Mr. Ernest G. Davies, architect, 6, St. John-street, Hereford:—
J. Hiles £355

HEREFORD.—Accepted for the erection of a villa residence, on the St. Owen's Estate, for Mr. Francis Preece. Mr. Ernest G. Davies, architect, 6, St. John-street, Hereford:—
G. Williams ..... (Schedule of prices)

KIRKINTILLOCH (N.B.).—For the execution of drainage works, for the Dumbarton County Council. Mr. David Dunbar, County Sanitary Inspector, &c., 24, George-square, Glasgow. Quantities by the Sanitary Inspector:—

John Paton & Co.	£637 3 9	William Gow	£505 12 1
Craik & Henry	578 10 8	Thos. Pate & Sons	498 5 8
Brown & Colville	575 4 3	Con. Boyle	451 10 3
Alex. Stark & Sons	553 17 10	James Miller	445 10 8

LEEDS.—For the erection of school buildings, St. Luke's, Beeston-hill. Mr. W. S. Braithwaite, architect, 6, South Parade, Leeds:—

Brick and Mason.—Walter Lolley £650 1 1
Carpenter and Joiner.—Tom Benton 430 0 0
Plumber and Glazier.—J. Lindley 123 0 0
Painter.—Chas. Hirst 23 0 0
Plasterer.—W. Pennington 45 16 0
Slater.—J. W. Richmond 60 10 0
[All of Leeds.]

LONDON.—For repairs to Primitive Methodist church, Castle-street, Kingsland:—

Steed	£221 0	Coldwells & Son	£198 0
Atkins	198 10	Stapleton (accepted)	179 0

For lighting and heating.

Pickup & Co. (accepted) £62 10

LONDON.—For the erection of three shops, Old Kent-road. Mr. H. Lewis Upham, architect, Sydenham:—

A. Sykes	£2,940	T. R. Roberts & Co.	£2,590
Yardley & Sons	2,797	Jerrards	2,587
J. W. Faulkner	2,770	A. Black & Son	2,580
W. Marriage	2,600	W. Johnson & Co.	2,4 0
J. & C. Bowyer	2,645	H. L. Holloway (accepted)	2,283

NEWPORT (Mon.).—For rebuilding business premises, 46 and 47, High-street. Messrs. Habershon & Fawckner, architects, 41, High-street, Newport. Quantities by the architects:—
W. M. Blackburn, Newport £2,889 5

NEWPORT (Mon.).—For the erection of business premises, Commercial-street and Palmyra-place, for Mr. H. L. Daw. Messrs. Habershon & Fawckner, architects, 41, High-street, Newport. Quantities by the architects:—
T. G. Diamond, Newport £1,116

NEWPORT (Mon.).—For the erection of business premises, Tredegar-place, for Messrs. Davies & Son. Messrs. Habershon & Fawckner, architects, 41, High-street, Newport:—

R. Williams & Son	£1,583	E. Richards	£1,398
T. G. Diamond	1,540	W. M. Blackburn	1,285
G. Wilkins	1,447	W. Moore	1,352
W. Price	1,447	T. Westacott	1,325
W. A. Linton	1,410	E. C. Jordan	1,297
J. Linton	1,399	[All of Newport]	

NEWPORT (Mon.).—For the erection of farm-house near St. Mellon's, for Lord Tredegar. Messrs. Habershon & Fawckner, architects, Newport:—

Lattey & Co.	£946 0 0	C. C. Dunn	£779 17 2
T. Westacott	885 0 0	W. Symonds & Co.	789 0 0
W. Price	883 0 0	E. C. Jordan	750 0 0
J. Linton	870 0 6	W. A. Linton	695 0 0
J. Allan	838 0 0		

NOTTINGHAM.—For making a new road (Elm Bank Drive) Mapperly-road. Mr. Henry Sulley, architect, Albert-chambers, Albert-street, Nottingham:—

John Hawley & Son	£521 12	Samuel Thumbs, Canal-street, Nottingham*	£394 0
Thos. Smart	451 13		
H. H. Barry	402 7	Accepted.	

SCARBOROUGH.—Accepted for pulling down cottages, &c., and erecting school buildings on same site, the Friarage, for the School Board. Mr. J. Caleb Petch, architect, Bank-chambers, Scarborough. Quantities by the architect:—

Brick, Stone, and Plastering.—A. Moore £5,439 0 0
Joinery.—W. Jowsey 2,000 0 0
Tiling.—J. Hardgrave 1,033 0 0
Plumbing.—D. Maynard 598 0 0
Ironfounding.—Appleby & Brogden 489 2 4
Painting.—Thos. Fidler 114 0 0
[All of Scarborough.]

SHEFFIELD.—For the construction of about 700 yards of 12-in. pipe sewer, &c., Burn Cross, Chapeltown, for the Guardians of Wortley Union. Mr. George E. Beaumont, surveyor, Grenoside, near Sheffield:—

E. Hindle	£465 0	John E. Nadin	£376 0
E. Armitage	438 10	George Hall, Heeley, Sheffield*	346 0
Joseph King	430 0		
John Hill	402 0	* Accepted	

SHREWSBURY.—Accepted for the erection of three cottage-residences, Greenfields, for Mr. John Breeze Mr. John R. Withers, architect, St. Mary's Court, Shrewsbury:—
E. H. Nicholas £760

SOUTHALL (Middlesex).—For the erection of a cemetery chapel, Havelock-road, for the Southall-Norwood burial board. Mr. T. Newell, architect, 2, Avenue-road, Southall:—

Foord	£675 0
Brown, Southall (accepted)	636 15
A. & B. Hanson	634 17

WOLVERHAMPTON.—Accepted for the erection of houses and alterations and additions to Alma Cottage, Evans-street, Whitmore Reans, for Mr. Joel Hobson Mr J. Mason, architect, Victoria Chambers, Bilston-street, Wolverhampton:

Marsh Bros., Pensnett	£640 12

TO CORRESPONDENTS.

F. J. B. (we cannot insert your letter).—Tenders for Cottages, Chelmer and Blackwater Navigation Company (we cannot print tenders lists not authenticated by any name and address of sender). —J. McK. (below our limit).—J. R. D. (ditto).—J. W. B. (amounts should have been stated).

We are compelled to decline pointing out books and giving addresses.

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Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [Advt.

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Academy Exhibition, 1894.

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STAIRCASE, "HURSTBOURNE," HANTS.—Messrs. Beeston & Burmester, Architects.

Royal Academy Exhibition, 1894

HARDING STREET FETTER LANE E.C.

CTS.

Illustrations.

ST. JOHN'S CRYPT, CLERKENWELL, E.C.

THIS fine crypt is practically all that remains of the Mediæval Church of the Priory of Knight Hospitallers of St. John of Jerusalem at Clerkenwell. It was the chief home of the order in England, and its Prior ranked as first Baron of England.

Until a few weeks ago its architectural beauties were quite hidden, the side aisles and transept being filled with the human remains of parishioners of the present and last centuries, and the floor of the nave covered with a mass of earth almost 2 ft. in thickness in which interments had also been made. Owing to the dreadfully insanitary state of the crypt an Order in Council was made for the removal of the remains to Woking Cemetery, which has just been complied with, and a beautiful and interesting piece of Gothic London is recovered.

The crypt now consists of a nave of five bays, a transept at the extreme east end, and two aisles, that on the south having two finely-vaulted bays. The north aisle is formed by two chambers with plain barrel vaults, and entered by a doorway out of the north transept. The three western bays of the nave are Early Norman, round-arched in character, and must have formed a small church before the Knights of St. John came to Clerkenwell, about the year 1100 A.D. The two eastern bays of the nave, together with the transepts and south aisle, have pointed-arched groining springing from triple-clustered columns of Transitional character. This portion appears to have been built to sustain the choir of the Priory Church, which was erected above it, and consecrated in the year 1185 A.D. by Heraclius, Patriarch of Jerusalem, who also consecrated the Temple Church, in which he was buried.

Much of the original colour-decoration still remains on the arches of the nave; it is a simple ornament of half-circles in a red pigment, and a chevron design in thin raised plaster running along the ribs of the groins. Round the earlier portions of the nave is a stone bench, forming a seat, and at the western end one jamb of the original doorway can be seen, with three steps leading down to the floor; this would appear to have been the original difference of level between the ground outside and inside, although now it is considerably below the outside level. It was originally lighted by small narrow shaped windows in each bay, and some of the iron stays and bars are still in their place; and iron rings, from which the means of artificial lighting was probably hung, remain in the centre of the arches.

It was this crypt which was visited in 1762 by Dr. Johnson and other gentlemen, during the excitement about the famous "Cock-lane Ghost," which had promised to knock on the coffin of "Mistress Fanny." W. M.

DESIGN FOR NEW HOUSES OF PARLIAMENT, TOKIO, JAPAN.

THE selection by the Japanese of German architects for all their new public buildings seems at first sight rather surprising. That this Europeanising nation should have been so ready to adopt ideas from the German army and the English navy is natural enough, but one would have expected that if they wished to Europeanise their architecture they would have gone to Paris rather than to Berlin. If we are rightly informed, however, the question was settled on considerations of diplomacy rather than of art, and there were political motives for the importation of German architects.

On April 15, 1893, we illustrated the new Law Courts at Tokio, showing both the design carried out and the one originally intended, which varied in accordance with the special tastes of political parties, who, on the one side, wished to imitate Western architecture entirely, and, on the other, were satisfied with appropriate adaptations. In the present number we publish a plan and a perspective of the design for the new Houses of Parliament which are being erected at the same place. The plan is being carried out on the lines here shown, but we understand that the architectural design is likely to be somewhat modified in adaptation to its surroundings. This, we suppose, means that the design will be given that curious dressing which we will term a Japo-Italian Renaissance, a good idea of which was given in one of our plates of the above-mentioned Law Courts. The architects, Messrs. Ende & Boeckmann, of Berlin, at first had a large staff of assistants at Tokio; these have now been paid off, and the firm has received due intimation that the designs purchased would be amended and carried out under native supervision, only one of the German staff remaining on the spot to act as adviser. One is naturally curious to see the result of this experiment.

The design we illustrate practically shows a block which would serve the purposes of any European legislative body with a large "Upper" and "Lower" House. As in the case of Professor Steindl's Budapest Houses of Parliament (see *Builder*, August 25) the architect's programme required the two houses to be treated as if of identical importance. Though there is a considerable difference in the number of seats in the council chambers of the Lords and Commons, their dimensions were to be the same, and both halls were to be equally conspicuous from without. Each house was to have a spacious *salle des pas perdues*, and there was to be a large central hall with a grand staircase for ceremonial purposes.

The plan, which explains itself, is certainly free from all complications, and the Lords' and Commons' wings, which are on either side of the central hall, are exact *fac-similes*. The main floor of the building is only a few steps above the road-level, and on passing the porter's boxes the visitor at once finds himself in the central hall. In front of him is the grand staircase which leads to the committee-room floor. On either side there are the *salles des pas perdues*, which, together with the cupola, form a most imposing *ensemble*. The total length of the combined *salles* is 100 mètres, and the cupola has a diameter of 20 mètres. Both chambers measure about 30 by 20 mètres, exclusive of the gallery accommodation, which is in loggias outside the actual area of the floor. There is ample passage-room, and each chamber has a large library and dining-room. At the farther end of each wing are the Speaker's offices, Minister's studies, and the press rooms. Two stairs in each case lead to a separate business entrance on the basement level, and at the same time facilitate communication with the upper floor. Off a long passage at the back there is a row of offices, most of which are used for committee purposes.

The upper floor, as already implied, is practically entirely devoted to committee-rooms, the dimensions of which vary from 5 by 7 mètres to 10 by 22 mètres. At the head of the grand staircase there is, however, also a reception-room for the Mikado. The loggias to the chambers have their approach from this floor, and the press has a number of rooms. The loggias have their own staircases for public use, and there are some service staircases besides. As regards the basement, this part of the building is only used for offices.

As to the architecture, it also practically explains itself. The so-called "Italian" Renaissance style of the Berlin school has been adopted, and there is a severe columnar treatment. The whole feeling is essentially German and academical, the dome alone (which we hope is "earthquake-proof") showing some originality. The materials to be used will be native free-stone, as far as possible. A number of Japanese workmen have been in Europe learning the different trades, especially masons' work.

The House of Parliament is only one of the numerous blocks which Messrs. Ende & Boeckmann designed for the Mikado's Government. Besides the Imperial Law Courts, which we illustrated, the most important of these are the Ministry of Justice, the Admiralty Office, and the Japanese "Scotland Yard." Both partners of the firm alternately visited Tokio, and Herr Boeckmann has very ably described his adventures and the difficulties encountered in the form of a "diary," published for private circulation. The late Herr Köhler and Herr Hartung were the chief assistants in charge of the work. Herr Seel, Messrs. Ende & Boeckmann's clerk of works, remained in Japan to act as adviser.

The Legislative bodies were first temporarily housed in a miniature wooden block erected from the same plans. This was burnt down in 1891, and then re-erected.

ENDALLS MANOR, WARGRAVE-ON-THAMES.

THE illustration shows the entrance-front to a house recently erected at Wargrave-on-Thames, Berkshire.

The entrance-porch and upper floors are in half-timber work and tile-hanging, all the timber-work being in oak. The remainder is in red brick and stone dressings. The tower has an extensive look-out, and contains the cisterns in the upper part.

The contractors were Messrs. J. Bottrill & Sons, of Reading. Mr. John Belcher is the architect.

THE GREAT HALL AND STAIRCASE, HURSTBOURNE, HANTS.

WE illustrate this week interior views of the Great Hall and Staircase of this Mansion, exterior views of which we published in our issues of November 11, 1893, and January 27, 1894.

It is proposed to execute the whole of the woodwork in oak, and to adapt certain old panelling, which has been acquired by Lord Portsmouth, for lining the walls.

The ribs and pendants of the ceiling will also be of oak, the spaces between the ribs, as well as the soffits of stairs, being filled with heraldic and other devices in *carton pierre*.

As before stated, the majority of the work is being executed by Lord Portsmouth's own workmen on the spot.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Sir John Hutton, Chairman, presiding.

Paddington Sewers.—With reference to an application from the Vestry of Paddington for the loan of 20,000*l.* on the annuity system, for twenty years, for special sewer works, the Finance Committee reported that:—

"Towards the end of the year 1890 the Vestry of Paddington invited tenders at a schedule rate for the execution of special works and repairs to a large number of old sewers in the parish. The works consisted chiefly of the construction of new inverts to old sewers, and up to December, 1893, seventy-two sewers had been partly reconstructed at a cost of 20,882*l.* 14*s.* 6*d.*, which has been paid for out of current rates. The vestry now desires to construct about 26,663 ft. run of new inverts to eighty-six old sewers, and to execute some slight repairs and pointing to a length of 8,925 ft. of sewer at an estimated cost of about 21,997*l.* and 627*l.*, making together 22,624*l.* It is a serious question (as it would form a precedent) whether the vestry should be allowed to borrow money for works of maintenance and repair to existing sewers, the expenditure for which should be, and, as far as we are aware, always has been, defrayed out of rate."

The report, however, after the statement of some facts bearing on the subject, concluded with the recommendation that:—

"For the sake of the public health the request of the vestry for a loan to carry out at once the remainder of the works should be acceded to, but that the period for repayment should be limited to five years, that being about the time by which the works would have been completed under the resolution of the vestry to expend 5,000*l.* per annum upon these special works."

A recommendation in accordance with the report was agreed to.

Battersea Public Baths.—On the recommendation of the Finance Committee, an application by the Commissioners for Public Baths and Washhouses for the Parish of Battersea, for a loan of 5,000*l.* to defray the cost of constructing an additional swimming-bath and other works, was granted, on condition that interest at the rate of 3*l.* 10*s.* per cent. per annum be paid quarterly, and that the principal be repaid by equal annual instalments within a period of thirty years.

Plans of Improvement Schemes.—The General Purposes Committee recommended, and the Council agreed, that the following be a standing order of the Council:—

"Whenever a committee resolves to bring up to the Council a scheme involving the acquisition of land at a cost exceeding 1,000*l.*, a cartoon plan of the scheme shall be prepared in the proper department and hung in the Council chamber."

Cleansing Gullies of Main Sewers.—The Main Drainage Committee made the following report:—

"Under Section 16 of the Council's General Powers Act, 1894, the duty of cleansing every grating and gully in any street communicating with any sewer of the Council (except in streets vested in and cleansed by the Council) so far as such grating or gully belongs to or is under the control of the Council, shall as from the passing of the Act be transferred to the vestry of the parish or the board of works for the district within which the same is situate. Hitherto the gullies connected with the main sewers on the north side of the Thames have been under the control of the Council, and the Council has undertaken the cleansing and removal of the slop from them. On the south side of the Thames all gullies connected with the main sewers have, in accordance with an arrangement made about twenty-five years ago, been under the control of the local authorities, and cleansed and repaired by them. We recommend—'That the local authorities of the districts on the north side in which there are gullies connected with the main sewers be informed that after the end of this year the Council will cease to undertake the cleansing of them, and that the duty will from that time devolve upon the local authorities as provided by Section 16 of the Council's General Powers Act, 1894.'"

The recommendation was agreed to.

Tower Bridge (Southern Approach) Bill.—The Parliamentary Committee recommended—

"That it be referred to the Parliamentary and Improvements Committees to consider and report to the Council.

CRYPT, ST. JOHN'S, CLERKENWELL (REC

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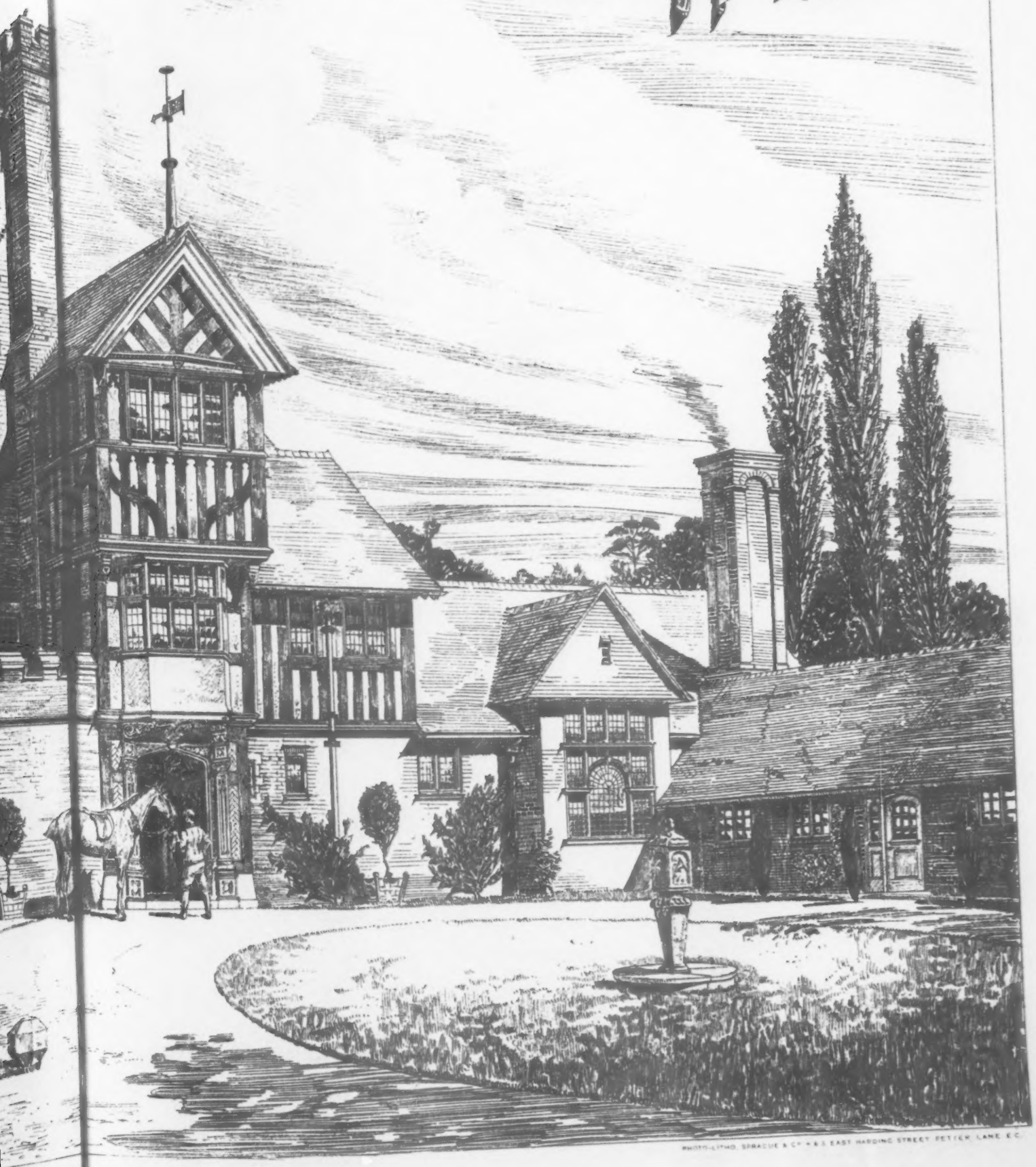
VELL (RE Y CLEARED).—From a Drawing by Mr. W. Monk.

Royal Academy Exhibition, 1894

"ENDALLS MANOR"
Wargrave on Thames.

John Belcher. Arch.t



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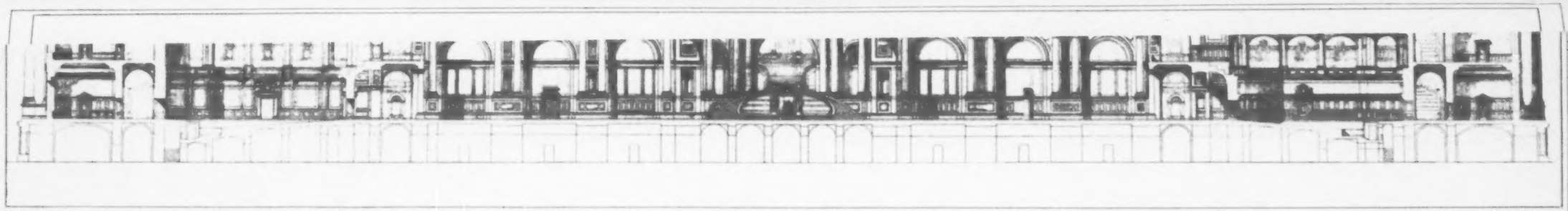

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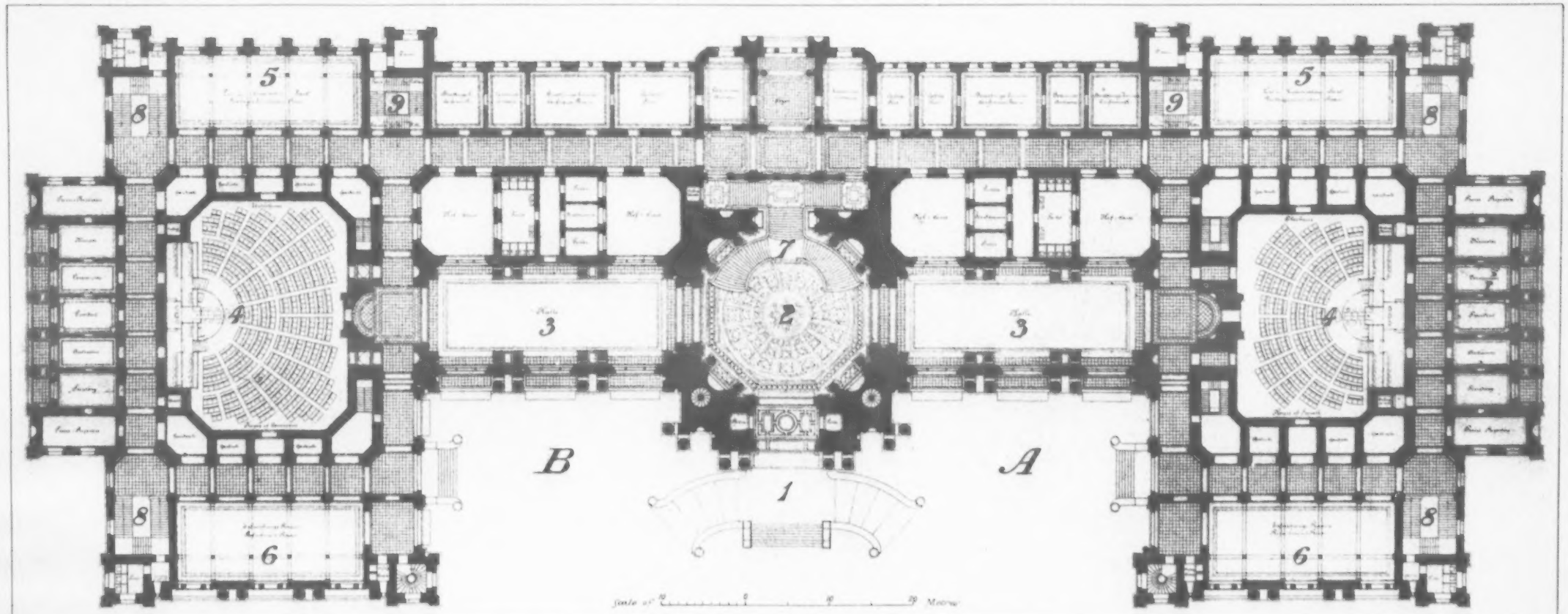


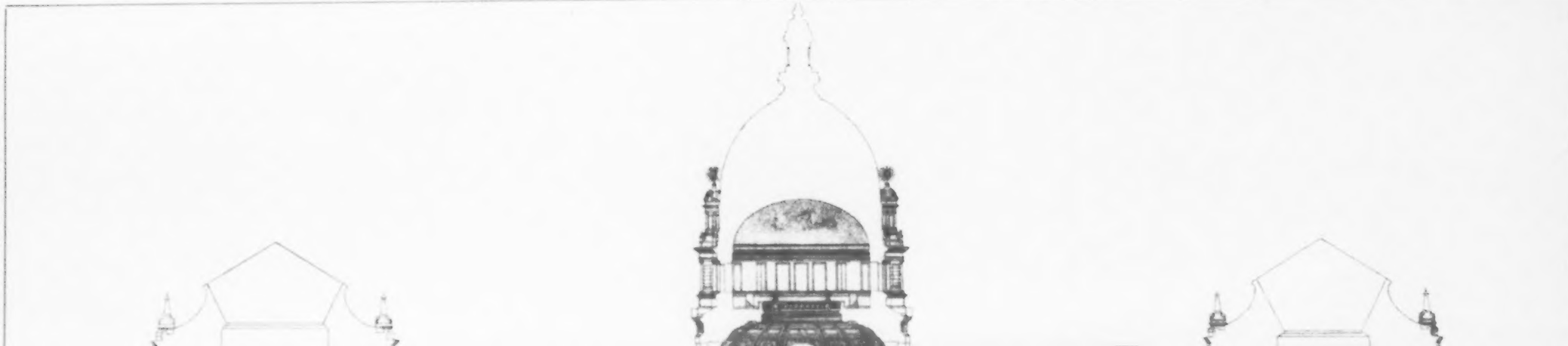
PLAN OF PRINCIPAL FLOOR.

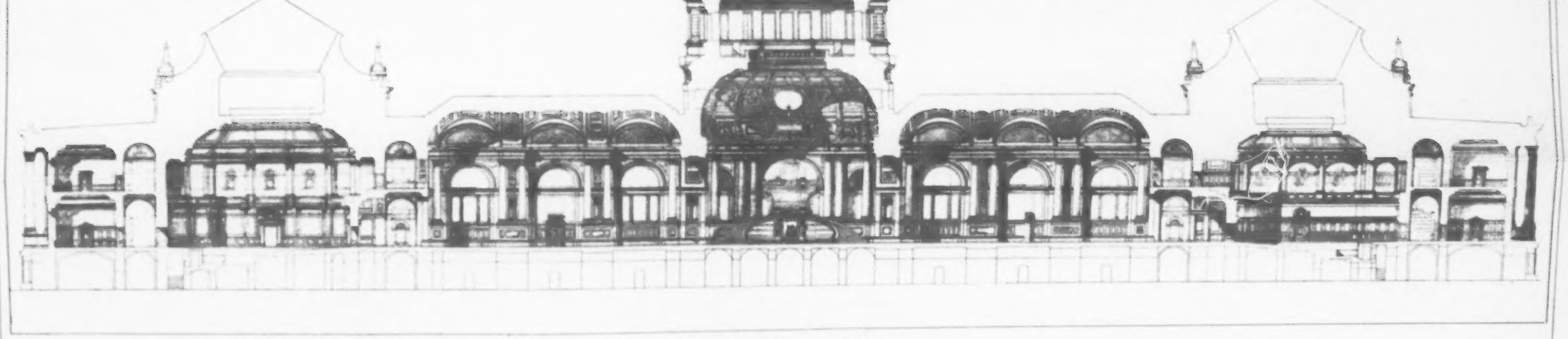
A.—House of Lords.
B.—House of Commons.
1.—Main Entrance.
2.—Central Hall.
3.—Salles des Pas Perdues.
4.—Council Chambers.
5.—Libraries.
6.—Refreshment Rooms.
7.—Grand Staircase.
8.—Business Staircases.
9.—Staircases to Public Galleries.

INK-PHOTO. SPRAGUE & CO. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

THE NEW JAPANESE HOUSES OF PARLIAMENT, TOKIO.—Messrs. Ende & Boeckmann, of Berlin, Architects.

PERSPECTIVE VIEW.





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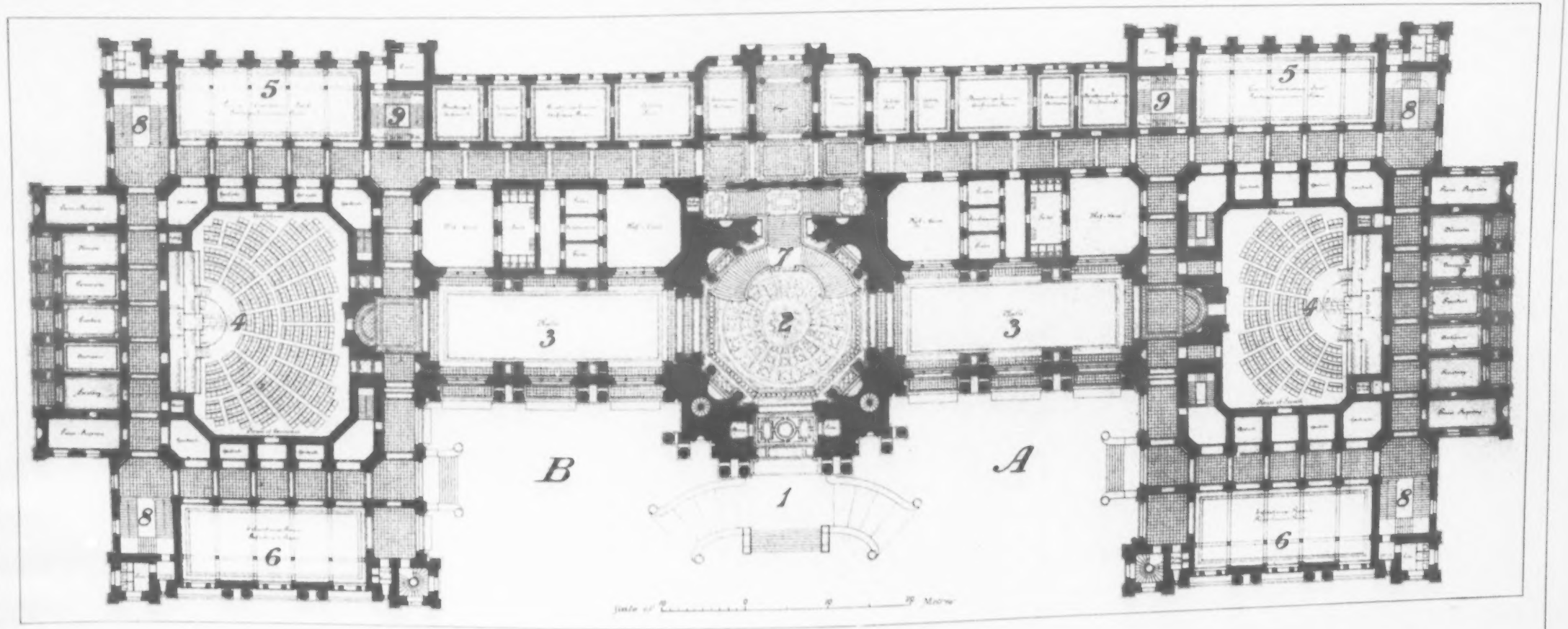

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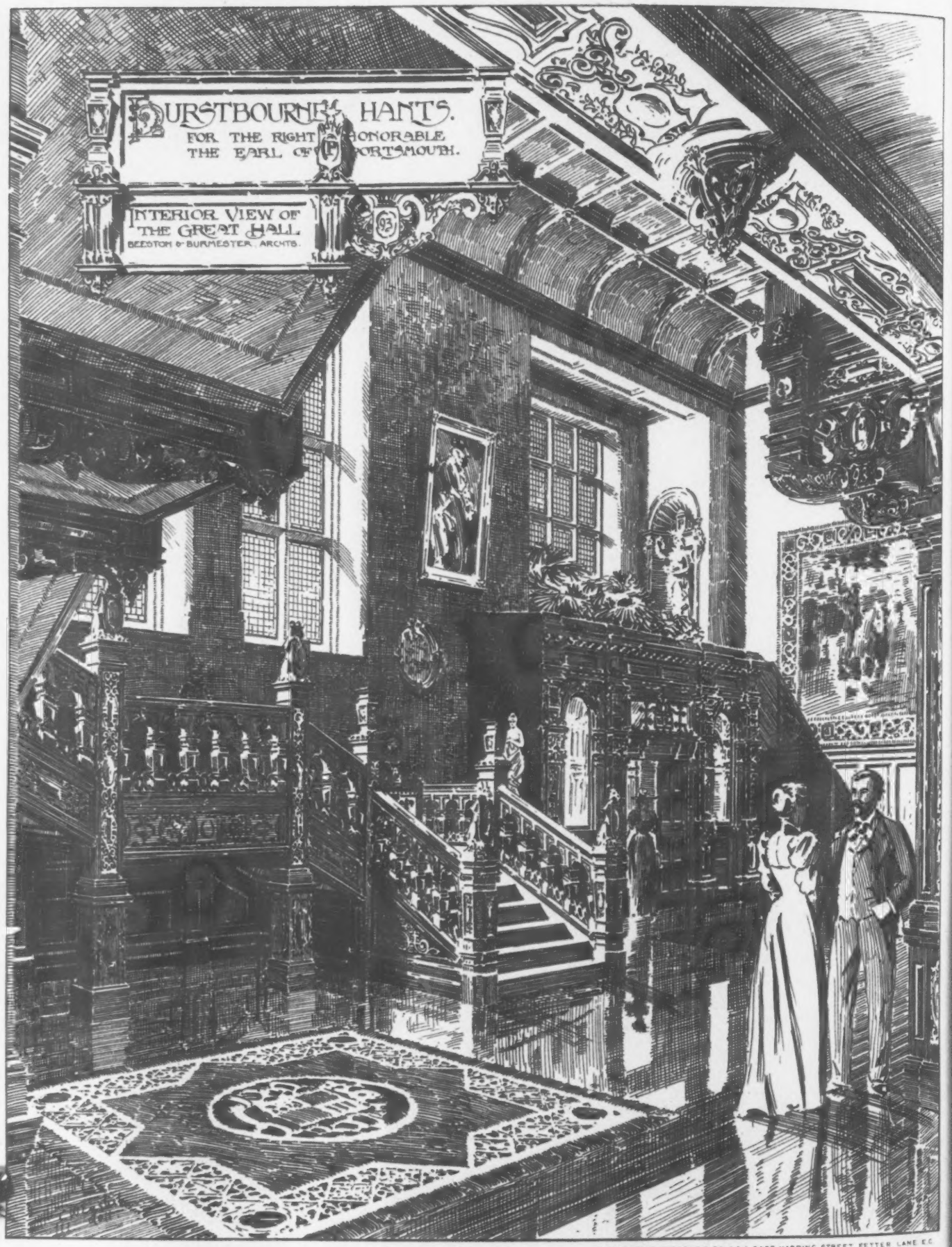
THE NEW JAPANESE HOUSES OF PARLIAMENT, TOKIO.—MESSRS. ENDE & BOECKMANN, OF BERLIN, ARCHITECTS.



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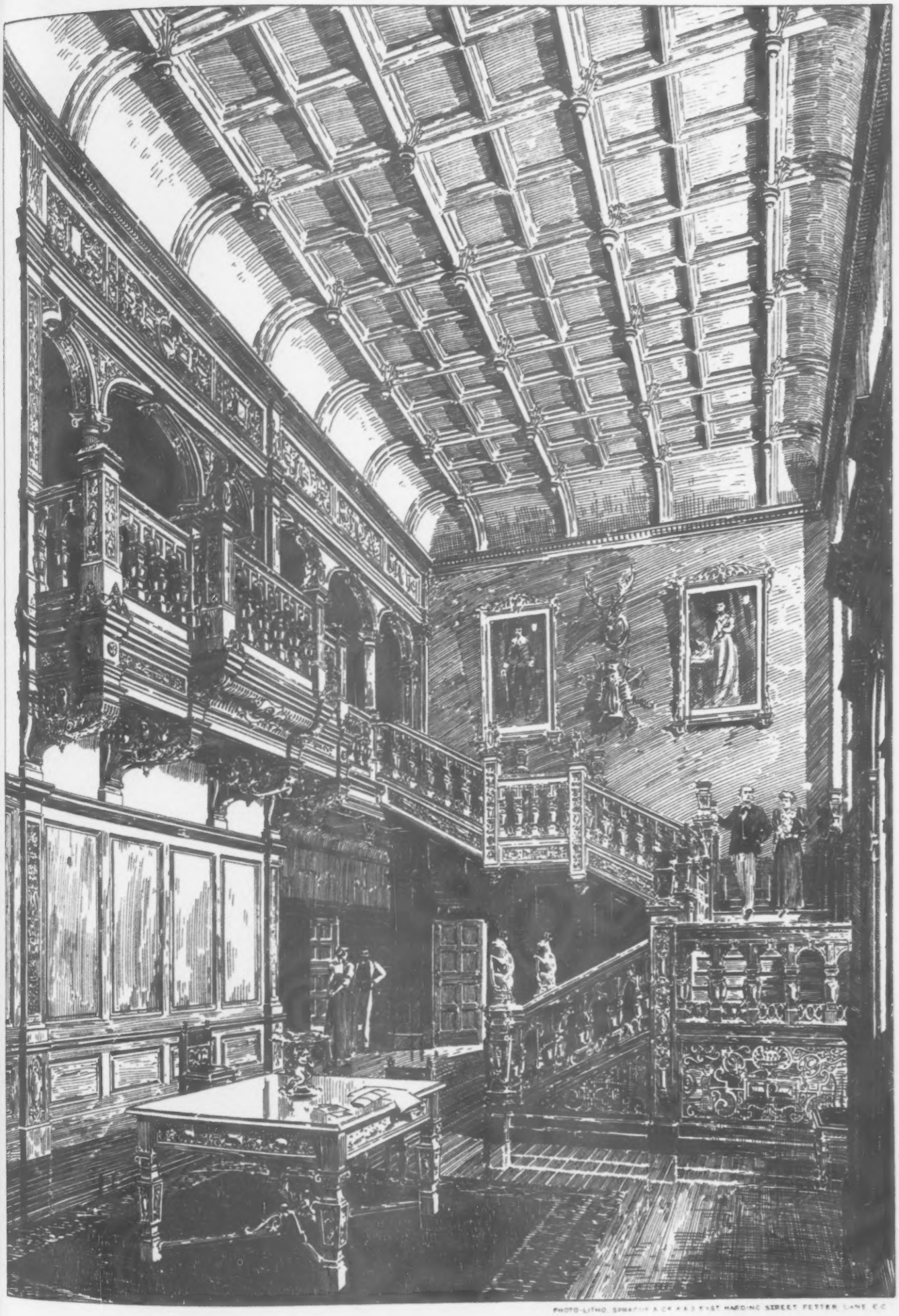
Royal Academy Exhibition, 1894.



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STAIRCASE, "HURSTBOURNE," HANTS.—Messrs. Beeston & Burmester, Architects.

Royal Academy Exhibition, 1894.

"ENDALLS MANOR"
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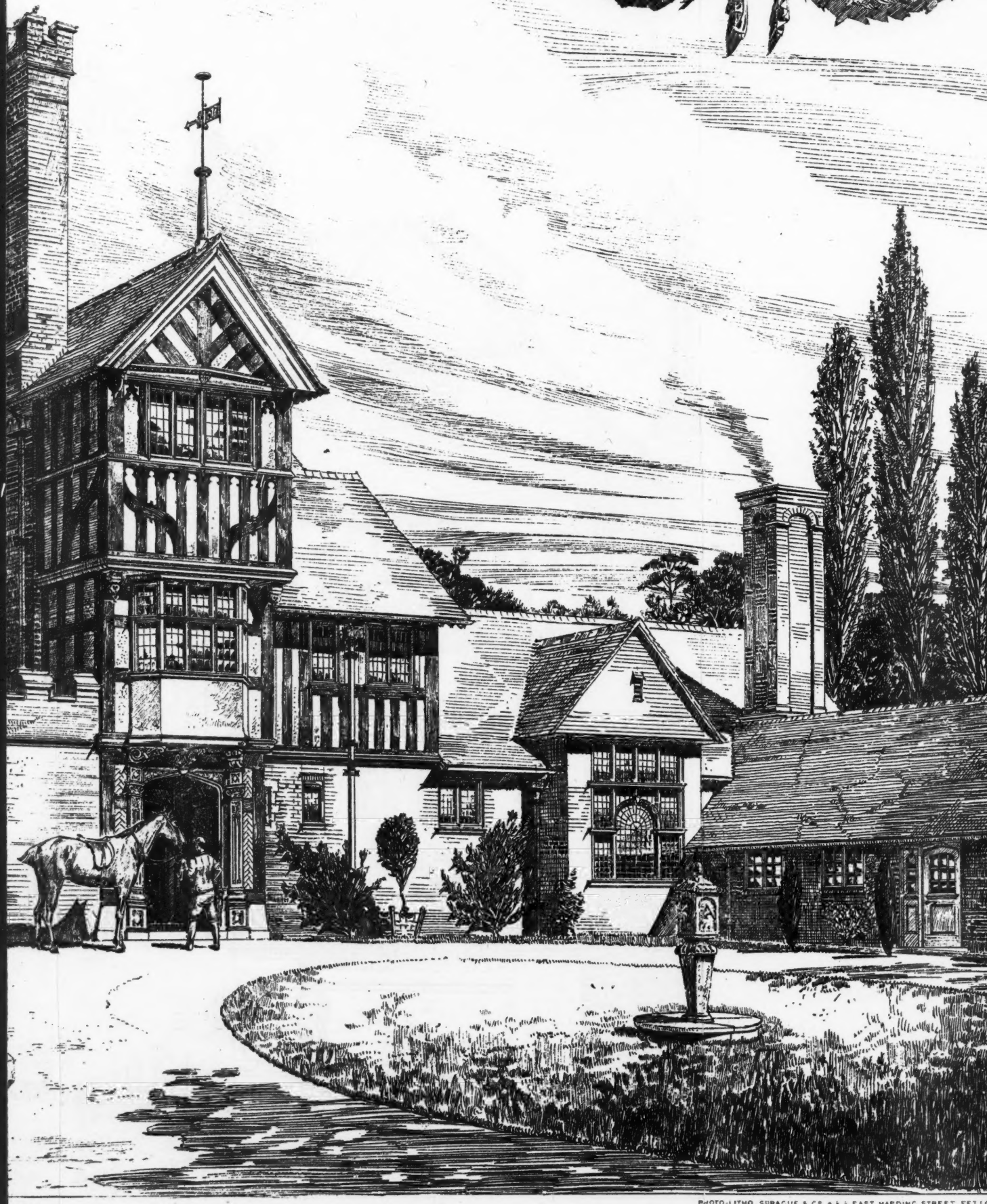

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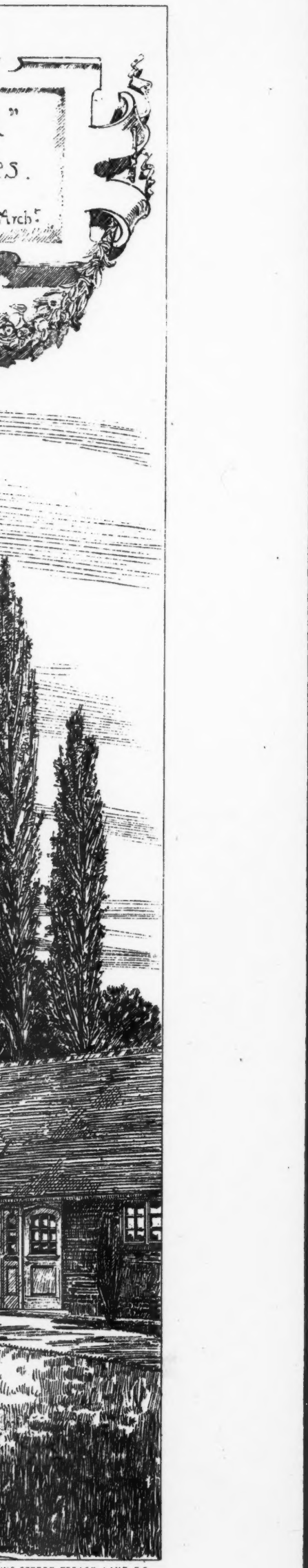
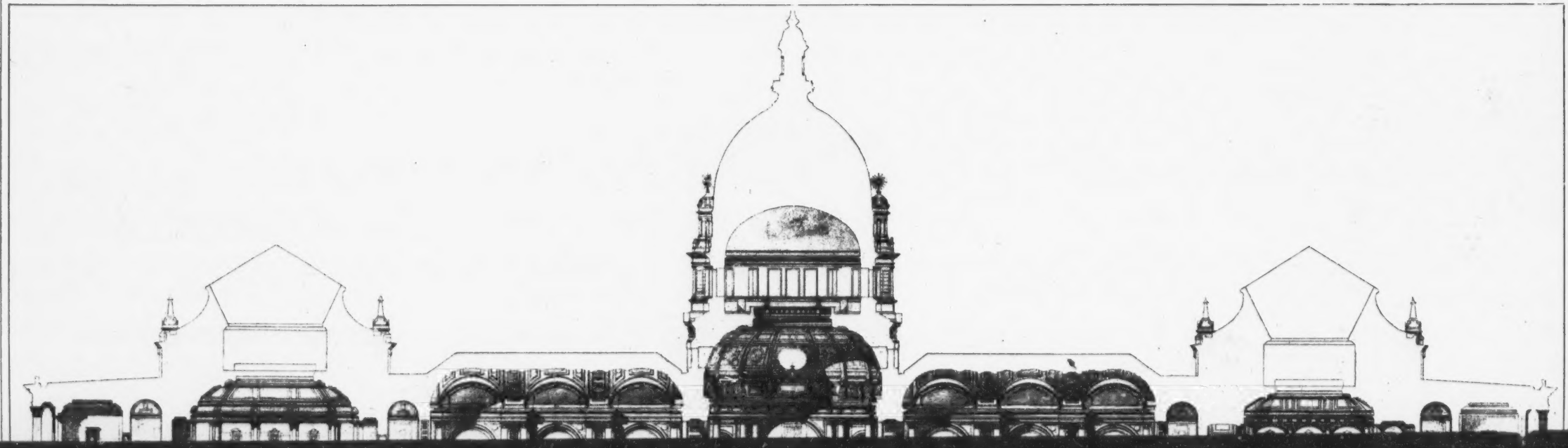
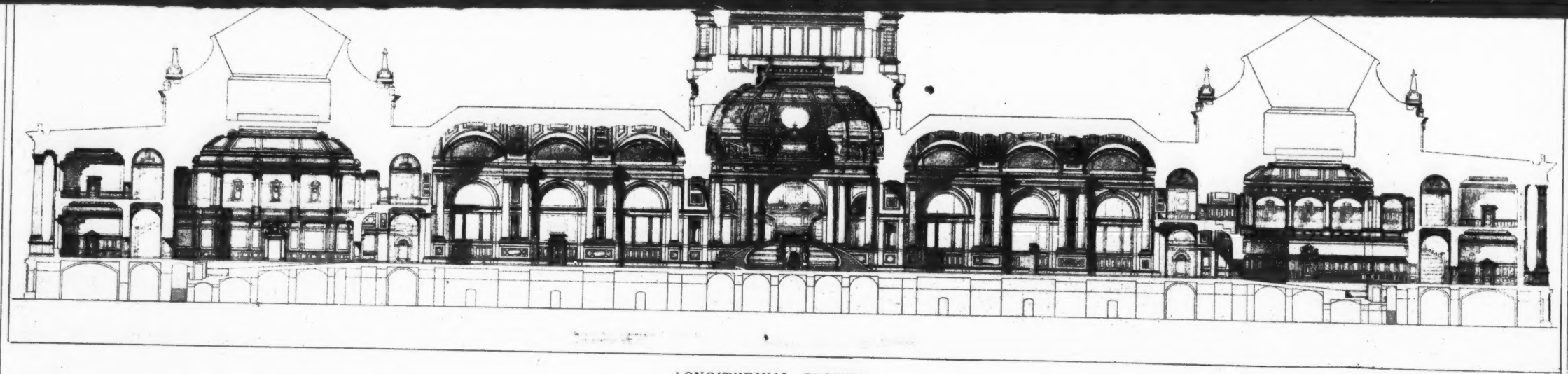


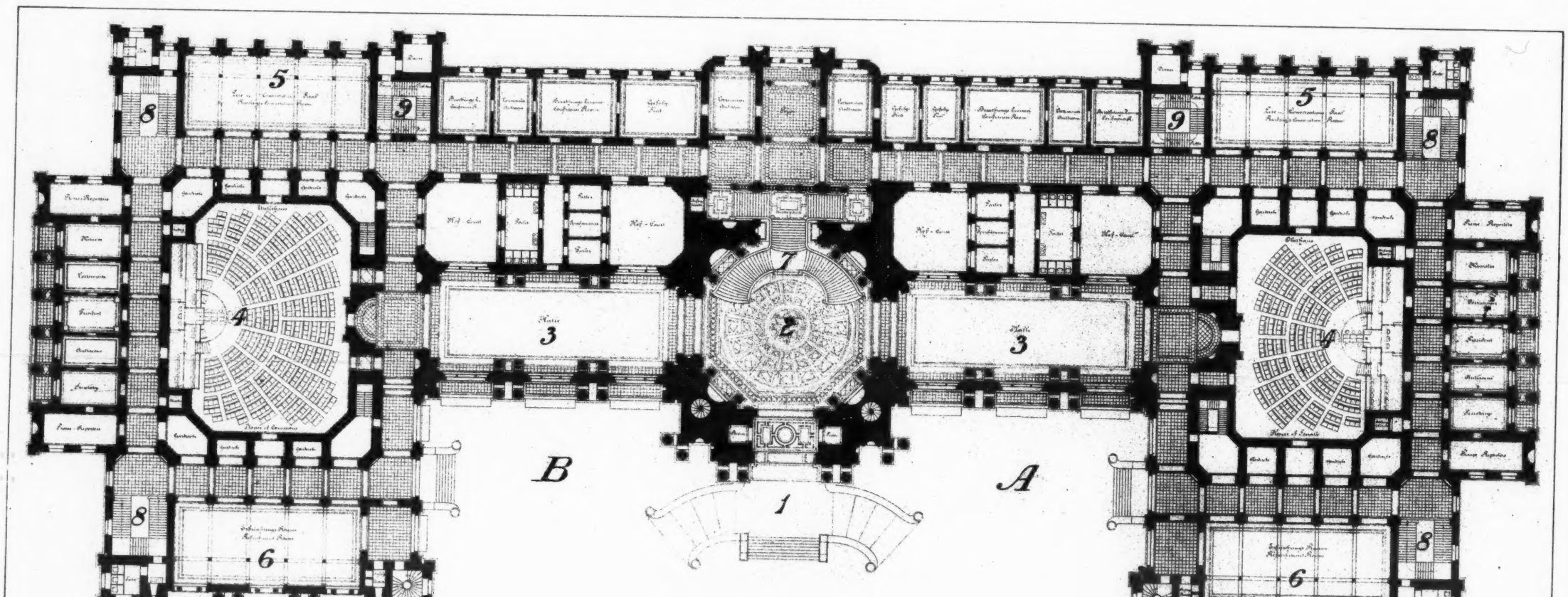
ING STREET FETTER LANE E.C.

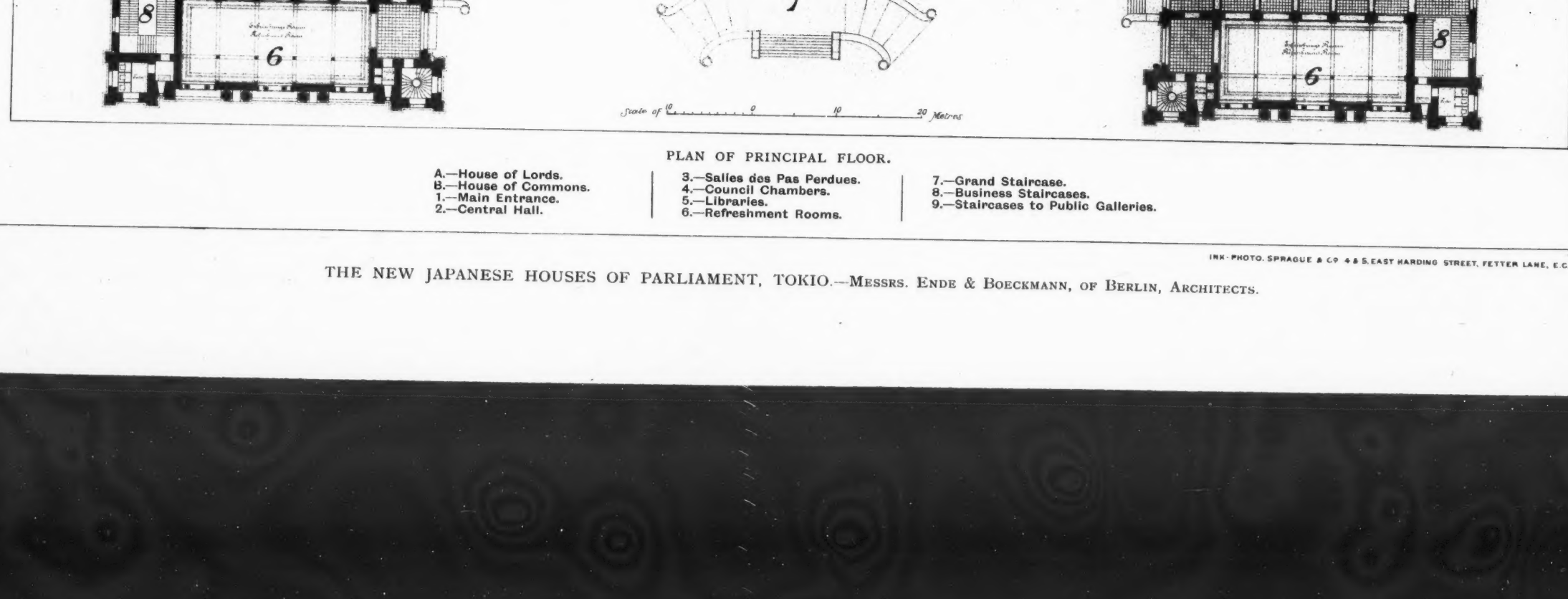
PERSPECTIVE VIEW.





LONGITUDINAL SECTION.





PLAN OF PRINCIPAL FLOOR.

A.—House of Lords.
B.—House of Commons.
1.—Main Entrance.
2.—Central Hall.
3.—Salles des Pas Perdues.
4.—Council Chambers.
5.—Libraries.
6.—Refreshment Rooms.
7.—Grand Staircase.
8.—Business Staircases.
9.—Staircases to Public Galleries.

INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE NEW JAPANESE HOUSES OF PARLIAMENT, TOKIO.—Messrs. Ende & Boeckmann, of Berlin, Architects.